**JOB NO.: TCS01196/22**

**WSD CONTRACT NO.: 7/WSD/21 -**

**CONSTRUCTION OF SIU HO WAN WATER TREATMENT WORKS EXTENSION AND SIU HO WAN RAW WATER BOOSTER PUMPING STATION**

# MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT – NOVEMBER 2022

**PREPARED FOR**

**CHINA ROAD AND BRIDGE CORPORATION**

| Date | Reference No. | Prepared By<br>Fai So | Certified By<br>Tam Tak Wing |
|---|---|---|---|
| 6 December 2022 | TCS01196/22/600/R0041v1 |  |  |
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| | | |

## EXECUTIVE SUMMARY

ES.01. Water Supplies Department (WSD) is the Proponent of the Works Contract 7/WSD/21 *"Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station" (hereinafter named as the "Works Contract")*. Under this Works Contracts, the works mainly comprise of increasing the water treatment capacity of Siu Ho Wan water treatment works (SHW WTW) from 150,000$m^3$ per day to 300,000$m^3$ per day within the existing water treatment works compound, by constructing new water treatment facilities and a new laboratory building and modifying the existing associated facilities; and constructing a new raw water booster pumping station at Siu Ho Wan to increase the raw water transfer capacity from Tai Lam Chung Reservoir to SHW WTW.

ES.02. According to the Environmental Impact Assessment Ordinance (EIAO), the proposed Siu Ho Wan Water Treatment Works Extension is a Designated Project under Schedule 2, which shall be implemented under the Environmental Permit EP-207/2005/A *(hereinafter called the "EP")*. Besides, the works for Siu Ho Wan Raw Water Booster Pumping Station is a non-designated project which mentioned in Section 1.10 of Environmental Monitoring and Audit (EM&A) Manual.

ES.03. On 20 March 2022, ***China Road and Bridge Corporation*** (hereinafter called the "Main *Contractor*") awarded the ***Works Contracts 7/WSD/21***. According to EM&A Manual, only air quality monitoring is required to be conducted which related to the works area under ***Contracts 7/WSD/21*** during construction phase of the SHW WTW Extension. Moreover, site inspection and audit is required under the EM&A program to ensure the recommended environmental mitigation measures are implemented properly and effective.

ES.04. The Main-*Contractor* appointed Action-United Environmental Services & Consulting (AUES) as the Environmental Team of the Project (hereinafter referred as the "ET") to implement air quality monitoring as well as associated duties in accordance with the EM&A Manual stipulation.

ES.05. As advised by the *Contractor*, the major construction works under Works Contract was commenced on 24 May 2022. This is the ***7th*** Monthly EM&A Report presenting monitoring results and inspection finding for the Project for the reporting period from ***1 to 30 November 2022***.

### ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.06. Environmental monitoring activities under the EM&A programme for the Contract in the Reporting Month are summarized in the following table.

| Issues | Environmental Monitoring Parameters / Inspection | Sessions |
|---|---|---|
| Air Quality | 24-Hour TSP | 5 |
| Inspection / Audit | ET Regular Environmental Site Inspection | 5 |
| | Joint site audit with *Project Manager*'s Delegate and IEC | 1 |

### ACTION AND LIMIT LEVELS EXCEEDANCE

ES.07. In the Reporting Month, no air quality monitoring exceedance was recorded.

### SITE INSPECTION

ES.08. In the Reporting Month, joint site inspections to evaluate the site environmental performance had been carried out by the representatives of the *PM*D, ET and the *Contractor* on ***1, 8, 15, 22 and 29 November 2022***. Joint site inspection with *PM*D, ET, IEC and the *Contractor* was carried out on ***29 November 2022***. No non-compliance was recorded during the site inspections.

### ENVIRONMENTAL COMPLAINT

ES.09. In the Reporting Month, no environmental complaint was received.

**NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

ES.010. In the Reporting Month, no prosecution or notification of summons was received.

**REPORTING CHANGE**

ES.011. There is no reporting change made for this monthly report.

**FUTURE KEY ISSUES**

ES.012. For dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to Siu Ho Wan Sewage Treatment Works. The *Contractor* should fully implement the construction dust mitigation measures as appropriately.

ES.013. All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

ES.014. All other mitigation measures recommended in the Implementation Schedule for Environmental Mitigation Measures of the EM&A Manual should be properly implemented and maintained as far as practicable.

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# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

1.1.1 Water Supplies Department (WSD) is the Proponent of the Works Contract ***7/WSD/21 – Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station*** *(hereinafter named as the "Works Contract")*. The Project works predicted by WSD will be undertaken about 34 months. Layout plan of the Project is shown in ***Appendix A***.

1.1.2 According to the Environmental Impact Assessment Ordinance (EIAO), the proposed Siu Ho Wan Water Treatment Works Extension is a Designated Project under Schedule 2, which shall be implemented under the Environmental Permit EP-207/2005/A *(hereinafter called the "EP")*. Besides, the works for Siu Ho Wan Raw Water Booster Pumping Station is a non-designated project which mentioned in Section 1.10 of Environmental Monitoring and Audit (EM&A) Manual.

1.1.3 The Works Contract construction activities mainly include:-

a. Extension of the existing Siu Ho Wan WTW within the existing Siu Ho Wan WTW compound from a capacity of 150,000 $m^3$/day to 300,000 $m^3$/day
b. Uprating of the treated/fresh water pumping capacity in the existing Siu Ho Wan Raw Water and Fresh Water Pumping Station within the existing Siu Ho Wan WTW compound from a capacity of 150,000 $m^3$/day to 300,000 $m^3$/day
c. Construction of the proposed Siu Ho Wan Raw Water Booster Pumping Station and the laying of the associated water mains

1.1.4 On 20 March 2022, ***China Road and Bridge Corporation*** (hereinafter called the "Main *Contractor*") awarded the Works Contracts ***7/WSD/21***. According to EM&A Manual, only air quality monitoring is required to be conducted which related to the works area under Contracts ***7/WSD/21*** during construction phase of the SHW WTW Extension. Moreover, site inspection and audit is required under the EM&A program to ensure the recommended environmental mitigation measures are implemented properly and effective.

1.1.5 The Main-*Contractor* appointed Action-United Environmental Services & Consulting (AUES) as the Environmental Team of the Project (hereinafter referred as the "ET") to implement air quality (baseline and impact) monitoring as well as associated duties in accordance with the EM&A Manual stipulation.

1.1.6 Some design changes of the Project have been identified after the EIA stage for betterment in the design development. Some of these changes requires supplementary environmental review to address their likely environmental impacts and to identify any additional mitigation measures required for compliance with the EIAO. Supplementary environmental review has been performed for the changes and the review results are presented in the "Review Report on Environmental Impact Assessment (Review Report on EIA)" prepared under "Agreement No. CE 82/2017 (WS)". Having reviewed the Review Report on EIA, no changes to the environmental monitoring requirement in the EM&A Manual are proposed for the work of SHW WTW Extension.

1.1.7 According to the approved EM&A Manual, only air quality is required to be monitored during the construction phase of the Project. As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Pursuant to the EM&A Manual, baseline environmental monitoring is required to be conducted prior to commencement of the construction works under the Project. Baseline air quality monitoring was conducted from ***8 to 21 April 2022***. During the baseline monitoring period, no major construction activities under the Project was observed.

1.1.8 As advised by the *Contractor*, the major construction works under Works Contract was commenced on 24 May 2022. This is the ***7th*** Monthly EM&A Report presenting monitoring results and inspection finding for the Project for the reporting period from ***1 to 30 November 2022***.

## 1.2 REPORT STRUCTURE

1.2.1 The Monthly EM&A Report is structured into the following sections:-

*Section 1* *Introduction*
*Section 2* *Project Organization and Construction Progress*
*Section 3* *Summary of Impact Monitoring Requirements*
*Section 4* *Air Quality Monitoring*
*Section 5* *Waste Management*
*Section 6* *Site Inspections*
*Section 7* *Environmental Complaints and Non-Compliances*
*Section 8* *Implementation Status of Mitigation Measures*
*Section 9* *Conclusions and Recommendations*

# 2 PROJECT ORGANISATION AND CONSTRUCTION PROGRESS

## 2.1 PROJECT ORGANISATION

2.1.1 The project organization is shown in ***Appendix B***. The roles and responsibilities of the various parties involved in the EM&A process and the organizational structure of the organizations responsible for implementing the EM&A programme are outlined below.

*Water Supplies Department (WSD)*

2.1.2 WSD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by WSD to audit the results of the EM&A works carried out by the ET.

*Environmental Protection Department (EPD)*

2.1.3 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

*Project Manager*'s Delegate *(PMD)*

2.1.4 The *PM*D is responsible for overseeing the construction works and for ensuring that the works are undertaken by the *Contractor* in accordance with the specification and contract requirements. The duties and responsibilities of the *PM*D with respect to EM&A are:

- Supervise the *Contractor*'s activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the *Contractor* when action is required to reduce impacts in accordance with the Event and Action Plans;
- Comply with the agreed Event Contingency Plan in the event of any exceedance.

*The Contractor*

2.1.5 The Main *Contractor* is responsible perform construction works and for ensuring that the works are undertaken compliance with the specification and contract requirements. The duties and responsibilities of the Main *Contractor* with respect to EM&A are:

- Employ an ET to undertake monitoring, laboratory analysis and reporting of environmental monitoring and audit;
- Provide information / advice to the ET regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact whenever Action and Limit levels are exceeded;
- Implement the corrective actions instructed by *PM*D;
- Accompany joint site audit undertaken by the ET; and
- Adhere to the procedures for carrying out complaint investigation.

*Environmental Team (ET)*

2.1.6 The ET is responsible perform implementation EM&A programmes of the Contract Works as stipulated in the Updated EM&A Manual ensure the works are fully compliance with environmental regulations. The duties and responsibilities of the ET with respect to EM&A are:

- Set up all the required environmental monitoring stations;
- Monitor various environmental parameters as required in the EM&A Manual;
- Analyze the EM&A data and review the success of EM&A programme to cost effectively confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the *Contractor*'s site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;

- Report on the EM&A results to the IEC, *Contractor*, the *PM*D and EPD or its delegated representative;
- Recommend suitable mitigation measures to the *Contractor* in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans;
- Undertake regular and ad-hoc on-site audits / inspections and report to the *Contractor* and the ER of any potential non-compliance; and
- Follow up and close out non-compliance actions.

*Independent Environmental Checker (IEC)*

2.1.7 The duties and responsibilities of IEC with respect to EM&A are:

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Report the audit results to the *PM*D and EPD in parallel;
- Review the EM&A reports (monthly summary reports) submitted by the ET;
- Review the proposal on mitigation measures submitted by the *Contractor* in accordance with the Event and Action Plans;
- Check the mitigation measures submitted by the *Contractor* in accordance with the Event and Action Plans;
- Check the mitigation measures that have been recommended in the EIA and this Manual, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to *PM*D and EPD;
- Coordinate the monitoring and auditing works for all the on-going contracts in the area in order to identify possible sources / causes of exceedances and recommend suitable remedial actions where appropriate; and
- Coordinate the assessment and response to complaints / enquires from locals, green groups, district councils or the public at large.

## 2.2 CONSTRUCTION PROGRESS

2.2.1 The major construction activities conducted under the Contract in the Reporting Period are listed below. The 3-month rolling construction programme is shown in ***Appendix C***.

- Installation of ELS and excavation at WTB and OLB
- Construction of car park barrack at DfMA Yard
- Excavation works for installation of ELS at BPS
- Diversion of OSCG trough
- Construction of chain link fence at DfMA Area
- Erection of Tower Crane at existing barrack

## 2.3 SUMMARY OF ENVIRONMENTAL PERMITS AND LICENCES

2.3.1 Summary of the relevant permits, licences, and/or notifications on environmental protection for the Project are presented in ***Table 2-1***.

**Table 2-1 Status of Environmental Licences and Permits of the Contract**

| Item | Description | Licence/Permit Status | | | |
|---|---|---|---|---|---|
| | | **Reference No./ License No./ Account No.** | **Approval Date** | **Expiry Date** | **Status** |
| 1 | Air Pollution Control (Construction Dust) Regulation | Ref: 477913 | 23 Mar 2022 | N/A | Valid |
| 2 | Waste Disposal Regulation – Billing Account for Disposal of Construction Waste | EPD Ref. No: RS02509 Acc. No.: 7043631 | 08 Apr 2022 | N/A | Valid |

| Item | Description | Licence/Permit Status | | | |
|---|---|---|---|---|---|
| | | Reference No./ License No./ Account No. | Approval Date | Expiry Date | Status |
| 3 | Chemical Waste Producer Registration | 5213-961-C4701-01 | 31 May 2022 | N/A | Valid |
| 4 | Water Pollution Control Ordinance – Discharge Licence | WT00041885-2022 | 8 Sep 2022 | 30 Sep 2027 | Valid |
| 5 | Construction Noise Permit | GW-RS0761-22 | 9 Sep 2022 | 18 Mar 2023 | Valid |

# 3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

## 3.1 GENERAL

3.1.1 Only air quality monitoring is required to carry out related to Works contracts ***7/WSD/21*** during the construction phase to ensure the dust mitigation measures and performance properly implementation.

3.1.2 The other environmental monitoring for Works Area of Pui O was related to other Works Contracts and will be implemented by other appointed ET.

3.1.3 According to the Review Report on EIA, no changes to the environmental monitoring requirement in the EM&A Manual are proposed for the work of SHW WTW Extension. Air quality monitoring work will be implemented according to the EM&A Manual.

## 3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Air quality;

3.2.2 A summary of impact monitoring parameters is presented in ***Table 3-1***:

**Table 3-1 Summary of Monitoring Parameters**

| Environmental Issue | Parameters |
|---|---|
| Air Quality | • 1-hour TSP by Real-Time Portable Dust Meter( as required in case of complaints); and<br>• 24-hour TSP by High Volume Air Sampler. |

## 3.3 MONITORING LOCATIONS

3.3.1 According to the Review Report on EIA, air quality monitoring work should be implemented according to the EM&A Manual. As stated in Section 4 of EM&A Manual, there was only one air quality monitoring station designated under SHW WTW Extension. The air quality monitoring locations is listed in ***Table 3-2***.

**Table 3-2 Designated Air Quality Monitoring Stations**

| Monitoring Station Identification No | Location |
|---|---|
| SHWAB | Siu Ho Wan WTW Administration Building |

## 3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of impact monitoring are stipulated in *Sections 2.1.9* of the approved EM&A Manual and presented as follows.

*Air Quality Monitoring*

3.4.2 Frequency of impact air quality monitoring is as follows:

- 1-hour TSP 3 times every six days (as required in case of complaints)
- 24-hour TSP Once every 6 days during course of works.

## 3.5 MONITORING EQUIPMENT

*Air Quality Monitoring*

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.* If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring are listed in below table.

**Table 3-3 Air Quality Monitoring Equipment**

| Equipment | Model |
|---|---|
| ***24-Hr TSP*** | |
| High Volume Air Sampler | TISCH High Volume Air Sampler, HVS Model TE-5170* |
| Calibration Kit | TISCH Model TE-5025A* |
| ***1-Hour TSP*** | |
| Portable Dust Meter | Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter / SidePak™ Personal Aerosol Monitor AM510 |

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix E.*

## 3.6 MONITORING PROCEDURES

***1-hour TSP***

3.6.1 Operation of the 1-hour TSP meter will follow manufacturer's Operation and Service Manual.

3.6.2 The 1-hour TSP monitor, brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 900 light scattering. The 1-hour TSP monitor consists of the following:

a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.3 The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Span check and BG of the instrument will be performed before each monitoring event. A valid calibration certificate is attached in ***Appendix E***.

***24-hour TSP***

3.6.4 The equipment used for 24-hour TSP measurement is the High Volume Sampler (hereinafter the "HVS") brand named TISCH, Model TE-5170 TSP High Volume Air Sampler, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The HVS consists of the following:

a. An anodized aluminum shelter;
b. A 8"x10" stainless steel filter holder;
c. A blower motor assembly;
d. A continuous flow/pressure recorder;
e. A motor speed-voltage control/elapsed time indicator;
f. A 7-day mechanical timer, and
g. A power supply of 220v/50 Hz

3.6.5 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground or the roof of building. The flow rate of the HVS between 0.6$m^3$/min and 1.7$m^3$/min will be properly set in accordance with the manufacturer's instruction to within the range recommended in *EPA Code of Federal Regulation, Appendix B to Part 50*. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-Hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-

- A horizontal platform with appropriate support to secure the samples against gusty wind should be provided;
- Installed with elapsed-time meter with ± 2 minutes accuracy for 24 hours operation;

- Equipped with a timing/control device with ± 5 minutes accuracy for 24 hours operation;
- With flow control accuracy for ± 2.5% deviation over 24-hour sampling period;
- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
- A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
- Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
- The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
- The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
- After sampling, the filter paper will be collected and transfer from the filter holder of the HVS to a sealed envelope and sent to a local HOKLAS accredited laboratory for quantifying.

3.6.6 All the sampled 24-hour TSP filters will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.

3.6.7 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in $m^3$/min. Motor brushes of HVS will be regularly replaced of about five hundred hours per time. Valid certificates of the calibration kit and HVS are attached in ***Appendix E***.

## 3.7 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

3.7.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual, the air quality criteria were set up, namely Action and Limit levels are listed in ***Tables 3-4***.

**Table 3-4 Action and Limit Levels of Air Quality**

| Monitoring Station | Action Level (μg /$m^3$) | | Limit Level (μg/$m^3$) | |
|---|---|---|---|---|
| | 1-hour TSP | 24-hour TSP | 1-hour TSP | 24-hour TSP |
| SHWAB | 291 | 170 | 500 | 260 |

## 3.8 METEOROLOGICAL INFORMATION

3.8.1 The meteorological information including wind direction, wind speed, humidity, rainfall, air pressure and temperature is extracted from the Chek Lap Kok Station. Meteorological data are attached in ***Appendix J***.

## 3.9 DATA MANAGEMENT AND DATA QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

3.9.1 All monitoring data were handled by the ET's in-house data recording and management system.

3.9.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at each monitoring day or after completion of baseline measurement. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.

3.9.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

# 4 AIR QUALITY MONITORING

## 4.1 GENERAL

4.1.1 The air quality monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarised in the following sub-sections.

4.1.2 In the reporting Period, no air quality complaint was received, thus no 1-hour TSP monitoring required to conduct according to ***Section 2.19*** of the approved EM&A Manual.

## 4.2 AIR MONITORING RESULTS

4.2.1 In the Reporting Period, a total of ***5*** events 24-hour TSP monitoring were carried out and the monitoring results are summarized in ***Table 4-1.*** The detailed 24-hour monitoring data are presented in ***Appendix H*** and the relevant graphical plots are shown in ***Appendix I.***

**Table 4-1 Summary of 24-hour TSP Monitoring Result – SHWAB**

| 24-hour TSP (μg/m$^3$) | |
|---|---|
| **Date** | **Meas. Result** |
| 4-Nov-22 | 50 |
| 10-Nov-22 | 66 |
| 16-Nov-22 | 93 |
| 22-Nov-22 | 51 |
| 28-Nov-22 | 38 |
| Average<br>(Range) | **60**<br>**( 38 – 93)** |

4.2.2 As shown in ***Tables 4-1***, all the 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

4.2.3 The meteorological data during the impact monitoring days are summarized in ***Appendix J***.

# 5 WASTE MANAGEMENT

## 5.1 GENERAL WASTE MANAGEMENT

5.1.1 Waste management was carried out in accordance with the Waste Management Section in the Environmental Management Plan for the Contract.

## 5.2 RECORDS OF WASTE QUANTITIES

5.2.1 All types of waste arising from the construction works are broadly classified into the following:

- Insert construction and demolition (C&D) material; and
- C&D waste.

5.2.2 The quantities of waste for disposal in this Reporting Month under the Contract are summarised in ***Tables 5-1*** and ***5-2*** and the Waste Flow Table as shown in ***Appendix K***. Whenever possible, materials were reused on-site as far as practicable.

**Table 5-1 Summary of Quantities of Inert C&D Materials for the Contract**

| Type | Quantity in Reporting Month | Disposal / Dumping Ground |
|---|---|---|
| Reused in this Contract (Inert) (in T) | 0 | NA |
| Reused in other Contracts/ Projects (Inert) (in T) | 0 | NA |
| Disposal as Public Fill (Inert) (in T) | 6598.800 | TM 38 |

**Table 5-2 Summary of Quantities of C&D Wastes for the Contract**

| Type | Quantity in Reporting Month | Disposal / Dumping Ground |
|---|---|---|
| Recycled Metal (‘000kg) | 0 | NA |
| Recycled Paper / Cardboard Packing (‘000kg) | 0 | NA |
| Recycled Plastic (‘000kg) | 0 | NA |
| Chemical Wastes (‘000kg) | 0 | NA |
| General Refuses (in T) | 37.250 | NENT |

# 6 SITE INSPECTIONS

## 6.1 REQUIREMENTS

6.1.1 According to the EM&A Manual, the programme of environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections were carried out to confirm the environmental performance.

## 6.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

6.2.1 In the Reporting Month, joint site inspections to evaluate the site environmental performance were carried out by the representatives of the *PM*D, ET and the *Contractor* on ***1, 8, 15, 22 and 29 November 2022***. Joint site inspection with *PM*D, ET, IEC and the *Contractor* was carried out on ***22 November 2022***. No non-compliance was recorded.

6.2.2 The findings / deficiencies observed during the weekly site inspections are listed in ***Table 6-1***.

**Table 6-1 Site Observations for the Contract**

| Date | Findings / Deficiencies | Follow-Up Status |
|---|---|---|
| 1 November 2022 | • The *Contractor* was advised to cover dusty materials with tarpaulin sheets at WTB. | • Tarpaulin sheets was provided for dust materials. |
| 8 November 2022 | • Soil and debris cumulated at the site boundary should be cleaned. (WTB)<br>• Earth bund/sand bag should be provided for the existing gully near the site boundary to prevent site generated water overflow during rainstorm. (WTB) | • Soil and debris at site boundary was removed.<br>• Reminder only. |
| 15 November 2022 | • Debris cumulated in drainage channel should be cleaned. (DfMA Area) | • Debris cumulated in drainage channel was cleaned. |
| 22 November 2022 | • Stockpile of loose material should be covered with tarpaulin when storage on-site. (WTB) | • Stockpile was covered with tarpaulin sheets. |
| 29 November 2022 | • The *Contractor* was advised to clean the dusty materials at site entrance of WTB.<br>• The *Contractor* was reminded to clean stagnant water on ground at WTB. | • Dusty Materials at site entrance was cleaned.<br>• Reminder only. |

# 7 ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCES

## 7.1 ENVIRONMENTAL COMPLAINTS, SUMMONS AND PROSECUTIONS

7.1.1 There was no environmental complaint, prosecution or notification of summons received in the Reporting Month.

7.1.2 The statistical summary table of the environmental complaints, summons and prosecution are presented in ***Tables 7-1, 7-2*** and ***7-3***. Detailed complaint log for the Contract is presented in ***Appendix L.***

**Table 7-1 Statistical Summary of Environmental Complaints**

| Reporting Month | Environmental Complaint Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Project related complaint |
| 23 to 31 October 2022 | 0 | 0 | 0 |
| 1 to 30 November 2022 | 0 | 0 | 0 |

**Table 7-2 Statistical Summary of Environmental Summons**

| Reporting Month | Environmental Summons Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Project related summons |
| 23 to 31 October 2022 | 0 | 0 | 0 |
| 1 to 30 November 2022 | 0 | 0 | 0 |

**Table 7-3 Statistical Summary of Environmental Prosecution**

| Reporting Month | Environmental Prosecution Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Project related prosecution |
| 23 to 31 October 2022 | 0 | 0 | 0 |
| 1 to 30 November 2022 | 0 | 0 | 0 |

# 8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

## 8.1 GENERAL REQUIREMENTS

8.1.1 The environmental mitigation measures recommended in the ISEMM in the EM&A Manual covered the issues of dust, noise, water, waste, land contamination and ecology and they are summarised and presented in ***Appendix M.***

8.1.2 The Contract works under the Project shall be implementing the required environmental mitigation measures according to the EM&A Manual as subject to the site conditions. Environmental mitigation measures generally implemented by the Contract and the implementation status are shown in ***Appendix M***.

## 8.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

8.2.1 According to the information provided by the *Contractor*, the major construction activities under the Contract in the coming month are listed below:

- Pre-boring and sheet piling works
- Construction of temporary shelter for Temporary Barrack
- Excavation works
- Construction of *Project Manager*'s temporary site office
- Construction of CLP Temporary Transformer Room
- DN50 Pipe laying for watermain
- Tree felling works

## 8.3 KEY ISSUES FOR THE COMING MONTH

8.3.1 For dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to Siu Ho Wan Sewage Treatment Works. The *Contractor* should fully implement the construction dust mitigation measures as appropriately.

8.3.2 All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

8.3.3 All other mitigation measures recommended in the Implementation Schedule for Environmental Mitigation Measures of the EM&A Manual should be properly implemented and maintained as far as practicable.

# 9 CONCLUSIONS AND RECOMMENDATIONS

## 9.1 CONCLUSIONS

9.1.1 As advised by the *Contractor*, the major construction works under Works Contract was commenced on 24 May 2022. This is the ***7th*** Monthly EM&A Report presenting monitoring results and inspection finding for the Project for the reporting period from ***1 to 30 November 2022***.

9.1.2 In the Reporting Period, no 24-hour TSP monitoring results triggered the Action/Limit level was recorded. No NOE or the associated corrective actions were therefore issued.

9.1.3 In the Reporting Month, joint site inspections to evaluate the site environmental performance had been carried out by the representatives of the *PM*D, ET and the *Contractor* on ***1, 8, 15, 22 and 29 November 2022***. Joint site inspection with *PM*D, ET, IEC and the *Contractor* was carried out on ***22 November 2022***. No non-compliance was recorded during the site inspections.

9.1.4 In the Reporting Month, no environmental complaint, prosecution or notification of summons was received. In addition, no emergency event related to violation of environmental legislation for illegal dumping and landfilling was received.

## 9.2 RECOMMENDATIONS

9.2.1 For dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to Siu Ho Wan Sewage Treatment Works. The *Contractor* should fully implement the construction dust mitigation measures as appropriately.

9.2.2 All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

9.2.3 All other mitigation measures recommended in the Implementation Schedule for Environmental Mitigation Measures of the EM&A Manual should be properly implemented and maintained as far as practicable.

# Appendix A

# Layout Plan of the Project

LEGEND:

- SITE BOUNDARY
- PROPOSED RAW WATER MAINS (BURIED)
- PROPOSED RAW WATER MAINS (EXPOSED)
- PROPOSED FENCING
- PROPOSED BUILDING WORKS

NOTE1:
THE EXISTING WASHWATER EQUAULIZATION TANKS TO BE RENAMED AS "THICKENER FEED TANKS"

PROPOSED SIU HO WAN RAW WATER BOOSTER PUMPING STATION

PROPOSED WATER TREATMENT BUILDING

CONSTRUCTION OF OSCG UNDER CONTRACT NO. 6/WSD/17

PROPOSED OFFICE AND LABORATORY BUILDING

DESIGNATED AREA FOR DfMA PREFABRICATION YARD

75m

50m

BARRACK

CHLORINE CONTACT TANK

CLEAR WATER TANK

SURGE VESSEL BAY

ADMINISTRATION BUILDING

SIU HO WAN PUMPING STATION

小蠔灣抽水站
Siu Ho Wan Pumping Station
翔東路640號
640 CHEUNG TUNG ROAD

FILTER GALLERY

STAGE 1 SEDIMENTATION BASIN AND FILTERS

濾池 Filter Beds

CHLORINE BUILDING

CHEMICAL BUILDING

SODIUM HYPOCHLORITE DOSING SYSTEM

DEWATERING BUILDING

SLUDGE THICKENERS

THICKENER FEED TANKS NOTE

WASHWATER EQUALIZATION TANKS

小蠔灣污水處理廠
Siu Ho Wan Sewage Treatment Works

小蠔灣食水處理廠
Siu Ho Wan Water Treatment Works

小蠔
Siu Ho

NORTH LANTAU HIGHWAY

Siu Ho Wan Vehicle Pound Vehicle Examination Area

817 600 E
817 800 E
818 000 E
819 400 N

DN1800
DN1200
DN1200
DN1200
DN1200
DN1200
DN1200

KEY PLAN
A1 1 : 50000
815 000 E
820 000 N
820 200 N
815 000 N

| Revision | Date | Description | Initial |
|---|---|---|---|
| 0 | 05/21 | ISSUE FOR TENDER DRAWING | JC |

| | Designed | Checked | Drawn | Checked |
|---|---|---|---|---|
| Initial | CT/CCK | YFC/AS | SZ | JC |
| Date | 05/21 | 05/21 | 05/21 | 05/21 |

Approved
James Chan

Contract No.
7/WSD/21

Contract Title
CONSTRUCTION OF SIU HO WAN WATER TREATMENT WORKS EXTENSION AND SIU HO WAN RAW WATER BOOSTER PUMPING STATION

Drawing Title
SITE LOCATION

Drawing No.
199755A/B&V/GN/00001

Revision
0

Scale
A1 1 : 750
A3 1 : 1500

水務署
Water Supplies Department

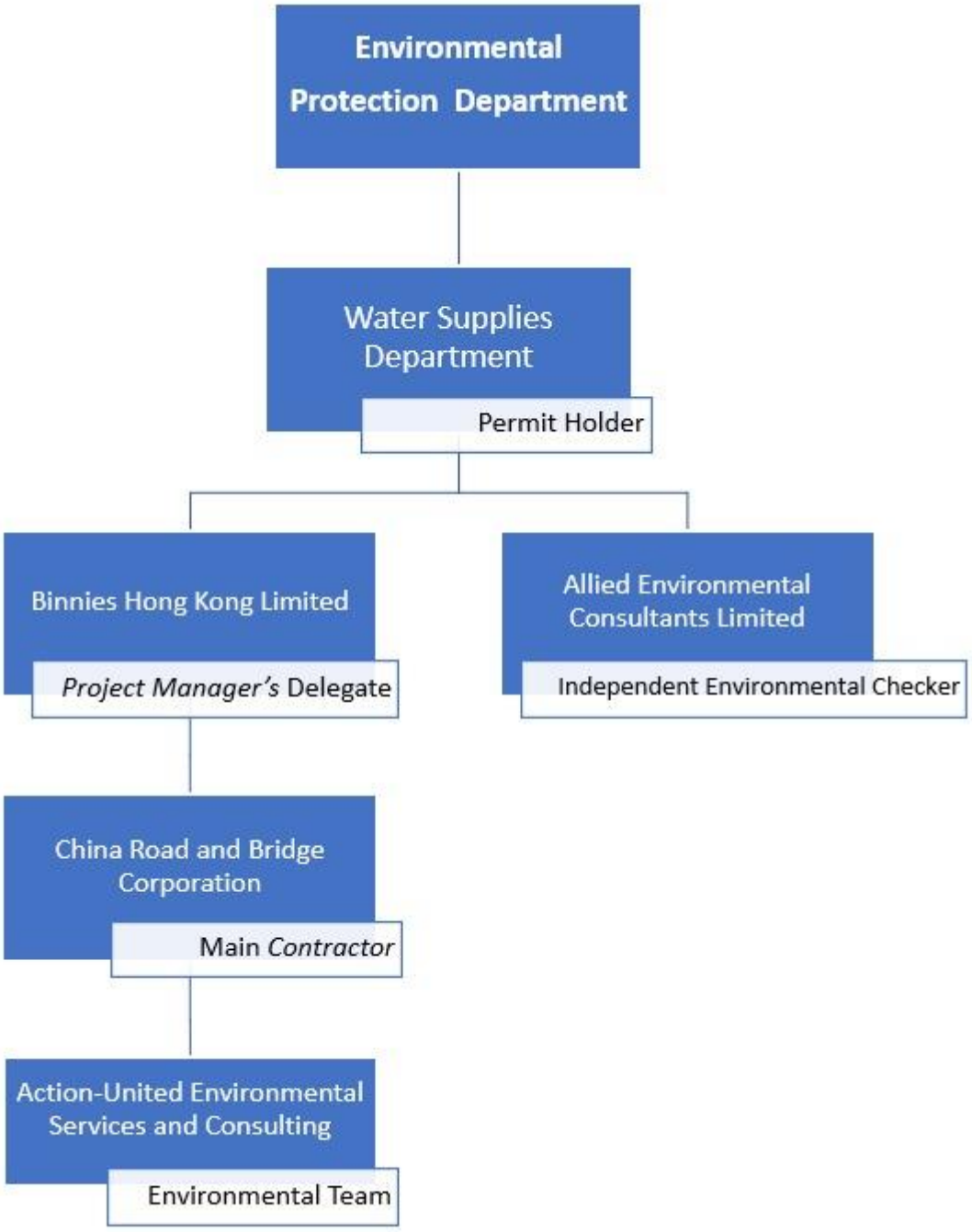
BINNIES HONG KONG LIMITED
賓尼斯工程顧問有限公司

Plot Date : 5/13/2021 2:49:08 PM

File Name : Y:\Daily Work\02 From other HK Projects\199755 -Tender Drawing\DWG\199755A-B&V-GN-00001

# Appendix B

# Project Organisation


Environmental Protection Department
Water Supplies Department
Permit Holder
Binnies Hong Kong Limited
*Project Manager's* Delegate
Allied Environmental Consultants Limited
Independent Environmental Checker
China Road and Bridge Corporation
Main *Contractor*
Action-United Environmental Services and Consulting
Environmental Team

## Contact Details of Key Personnel

| Organisation | Project Role | Position | Name | Tel No. |
|---|---|---|---|---|
| Binnies Hong Kong Limited | *Project Manager*'s Delegate | Chief Resident Engineer | Mr. Gilbert Ying | 6343 1027 |
| | | Senior Resident Engineer | Mr. Alex Tung | 9080 0079 |
| | | Resident Engineer | Ms. Jenny Ng | 9267 8638 |
| | | Assistant Resident Engineer | Mr. Warren Yeung | 6343 1010 |
| China Road and Bridge Corporation | *Contractor* | Site Agent | Mr. Raymond Mau | 5335 9571 |
| | | Works Manager | Mr. Chan Ming Tai | 9358 7007 |
| | | Environmental Officer | Ms. Iris Ho | 5611 8325 |
| | | Environmental Supervisor | Mr. Patrick Wan | 9618 0010 |
| Allied Environmental Consultants Limited | Independent Environmental Checker | Principle Consultant | Ms. Joanne Ng | 2815 7028 |
| Action-United Environmental Services and Consulting | Environmental Team | Environmental Team Leader | Mr. Tam Tak Wing | 2959 6059 |
| | | Environmental Consultant | Ms. Nicola Hon | 2959 6059 |
| | | Environmental Consultant | Mr. Ben Tam | 2959 6059 |

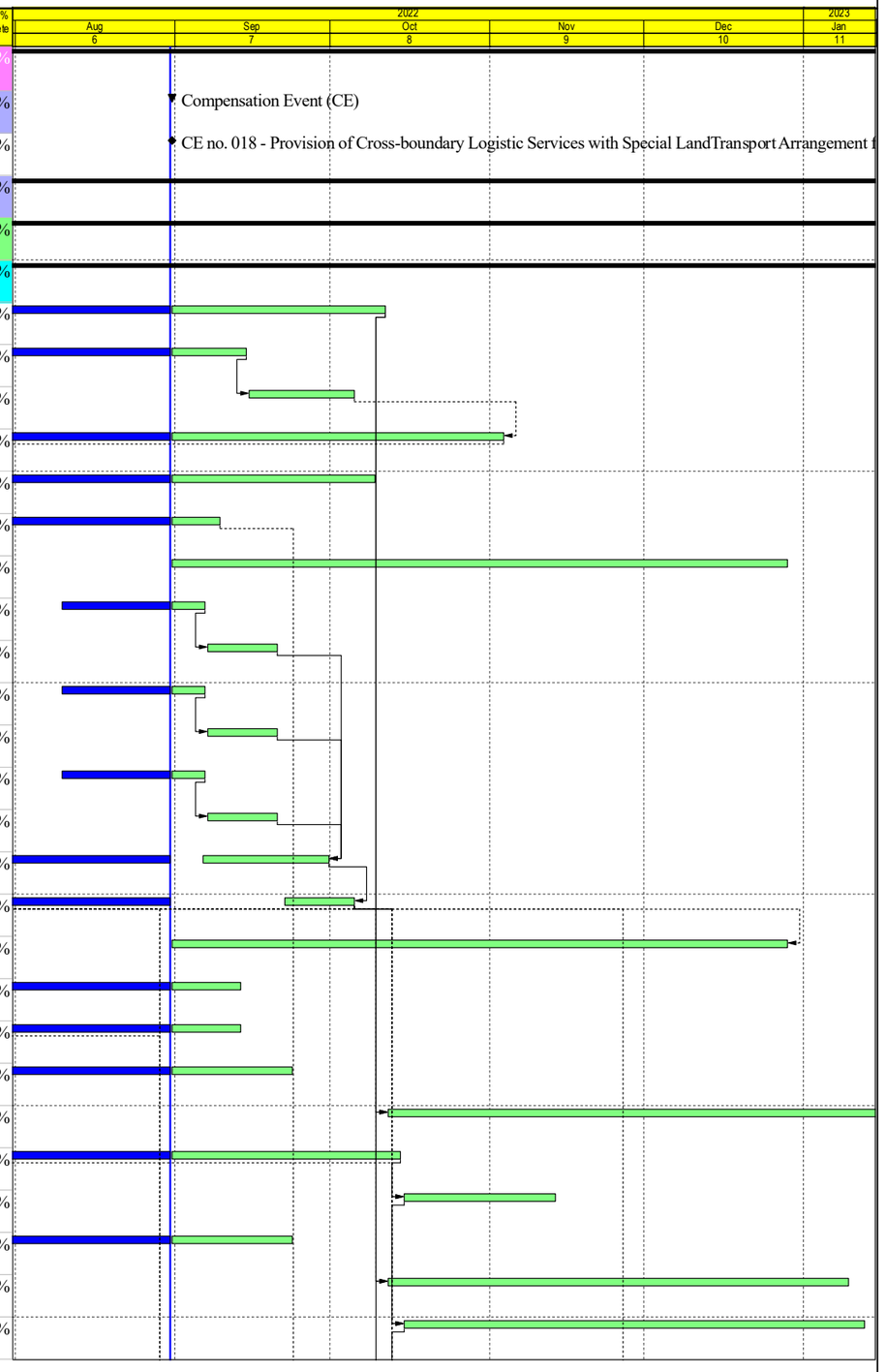
# Appendix C

# 3-month Rolling Construction Programme

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Construction of Siu Ho Wan Water Treatment Works Extension** | | 869.0 | 706.0 | 22-Apr-22 A | 05-Aug-24 | 22-Apr-22 | | 40.0 | 18.76% |
| **Compensation Event (CE)** | | 0.0 | 0.0 | 31-Aug-22 A | 31-Aug-22 A | 31-Aug-22 | 31-Aug-22 | | 0% |
| CE1160 | CE no. 018 - Provision of Cross-boundary Logistic Services with Special LandTransport Arrangement for Delivery of Mic | 0.0 | 0.0 | 31-Aug-22 A | | 31-Aug-22 | | | 100% |
| **Preliminaries, Contractor's Design,Method Statement Submission and** | | 838.0 | 611.0 | 22-Apr-22 A | 02-May-24 | 22-Apr-22 | | 135.0 | 27.09% |
| **Contractor's Design Submission and Approval** | | 272.0 | 180.0 | 22-Apr-22 A | 26-Feb-23 | 22-Apr-22 | | 566.0 | 33.82% |
| **Major Permanent Works Design** | | 272.0 | 180.0 | 23-May-22 A | 26-Feb-23 | 23-May-22 | | 566.0 | 33.82% |
| MDD3000 | Process Design Review | 90.0 | 42.0 | 31-May-22 A | 11-Oct-22 | 31-May-22 | | 36.0 | 53.33% |
| MDD3005 | Submission of Process and Instrumentation Diagram (P&ID) | 30.0 | 15.0 | 15-Jun-22 A | 14-Sep-22 | 15-Jun-22 | | 260.0 | 50% |
| MDD3006 | Comment and approval of P&ID | 21.0 | 21.0 | 15-Sep-22 | 05-Oct-22 | | | 260.0 | 0% |
| MDD3010 | Hazard and Operability studies | 150.0 | 65.0 | 24-May-22 A | 03-Nov-22 | 24-May-22 | | 231.0 | 56.67% |
| MDD3015 | Design of earth mat | 60.0 | 40.0 | 07-Jul-22 A | 09-Oct-22 | 07-Jul-22 | | 59.0 | 33.33% |
| MDD3025 | Comments and approval of Design for Ozone Equipment | 28.0 | 10.0 | 11-Jul-22 A | 09-Sep-22 | 11-Jul-22 | | 26.0 | 64.29% |
| MDD3040 | CFD baffle design for intermediate ozone contact tank | 120.0 | 120.0 | 31-Aug-22 | 28-Dec-22 | | | 147.0 | 0% |
| MDD3046.1 | CR drawings submission for BPS | 28.0 | 7.0 | 10-Aug-22 A | 06-Sep-22 | 10-Aug-22 | | 4.0 | 75% |
| MDD3046.2 | Comments and approval of CR drawings submission for BPS | 14.0 | 14.0 | 07-Sep-22 | 20-Sep-22 | | | 4.0 | 0% |
| MDD3046.3 | CR drawings submission for OLB | 28.0 | 7.0 | 10-Aug-22 A | 06-Sep-22 | 10-Aug-22 | | 4.0 | 75% |
| MDD3046.4 | Comments and approval of CR drawings submission for OLB | 14.0 | 14.0 | 07-Sep-22 | 20-Sep-22 | | | 4.0 | 0% |
| MDD3046.5 | CR drawings submission for WTB | 28.0 | 7.0 | 10-Aug-22 A | 06-Sep-22 | 10-Aug-22 | | 4.0 | 75% |
| MDD3046.6 | Comments and approval of CR drawings submission for WTB | 14.0 | 14.0 | 07-Sep-22 | 20-Sep-22 | | | 4.0 | 0% |
| MDD3050 | Design for Manufacture and Assembly(DfMA) works for civil structure works | 50.0 | 25.0 | 23-May-22 A | 30-Sep-22 | 23-May-22 | | 4.0 | 50% |
| MDD3055 | Comments and approval of design for Manufacture and Assembly(DfMA) works (civil structure works) | 28.0 | 14.0 | 19-Jul-22 A | 05-Oct-22 | 19-Jul-22 | | 4.0 | 50% |
| MDD3065 | Design for Manufacture and Assembly(DfMA) works for E&M works | 120.0 | 120.0 | 31-Aug-22 | 28-Dec-22 | | | 262.0 | 0% |
| MDD3085 | Comments and approval of design for DAF Equipment | 28.0 | 14.0 | 11-Jul-22 A | 13-Sep-22 | 11-Jul-22 | | 164.0 | 50% |
| MDD3095 | Comments and approval of Major Pumping Design | 30.0 | 14.0 | 02-Jul-22 A | 13-Sep-22 | 02-Jul-22 | | 193.0 | 53.33% |
| MDD3105 | Comments and approval of design for Hydraulics system | 30.0 | 24.0 | 04-Jul-22 A | 23-Sep-22 | 04-Jul-22 | | 222.0 | 20% |
| MDD3110 | Design for stage 2 architectural works | 120.0 | 120.0 | 12-Oct-22 | 08-Feb-23 | | | 121.0 | 0% |
| MDD3120 | Design for building services (including FSD submission) | 90.0 | 45.0 | 23-May-22 A | 14-Oct-22 | 23-May-22 | | 97.0 | 50% |
| MDD3125 | Comments and approval of design for building services | 30.0 | 30.0 | 15-Oct-22 | 13-Nov-22 | | | 97.0 | 0% |
| MDD3135 | Comments and approval of design for SRGF Equipment | 30.0 | 24.0 | 11-Jul-22 A | 23-Sep-22 | 11-Jul-22 | | 254.0 | 20% |
| MDD3140 | Design for BS Equipment (including emergency genset) | 90.0 | 90.0 | 12-Oct-22 | 09-Jan-23 | | | 36.0 | 0% |
| MDD3150 | Design for WTB POCT & IOCT Equipment | 90.0 | 90.0 | 15-Oct-22 | 12-Jan-23 | | | 97.0 | 0% |

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Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Milestone
Summary

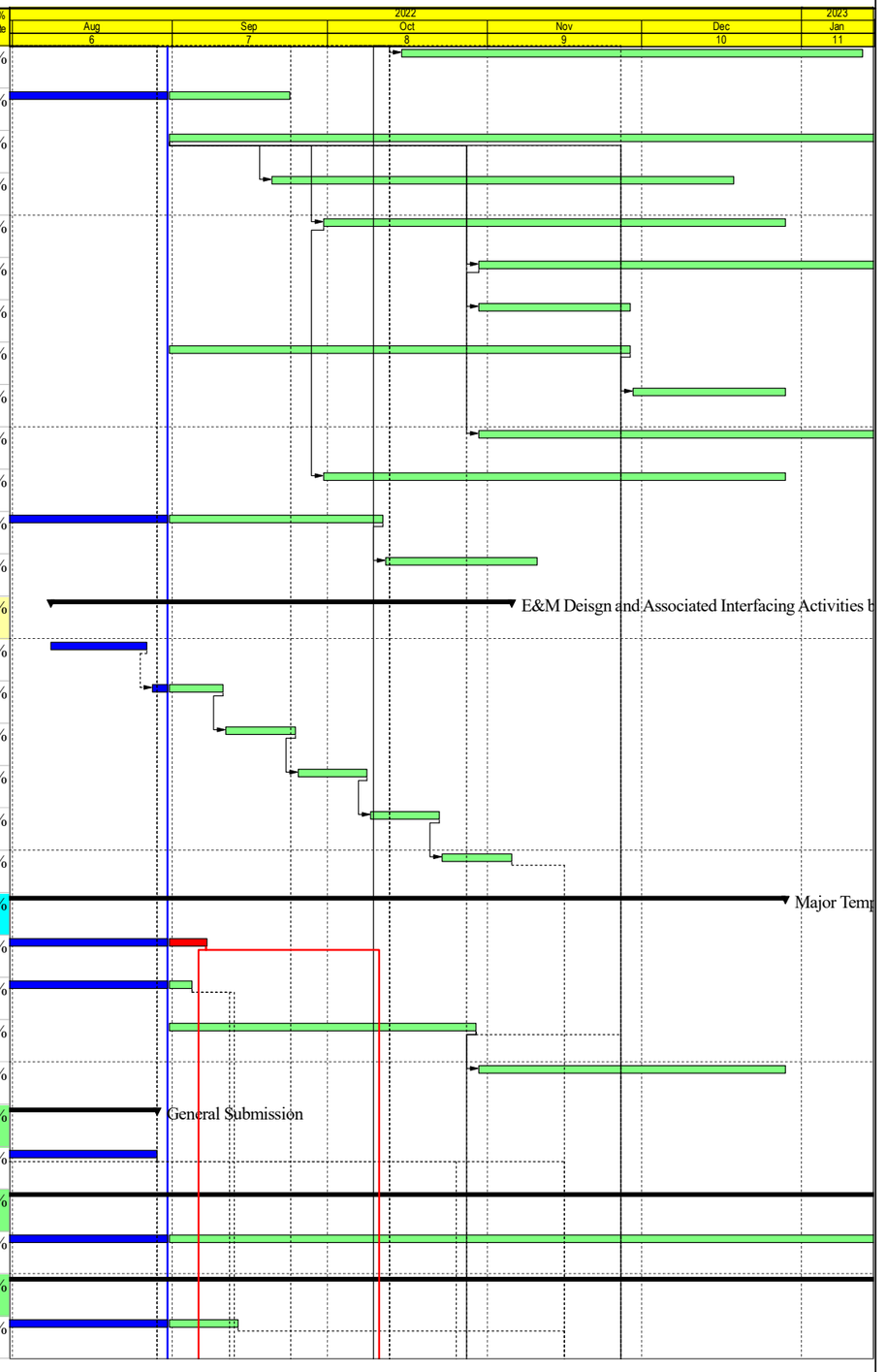
| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| MDD3160 | Design for surge analysis system | 90.0 | 90.0 | 15-Oct-22 | 12-Jan-23 | | | 97.0 | 0% |
| MDD3185 | Comments and approval of design for BACF Equipment | 28.0 | 24.0 | 11-Jul-22 A | 23-Sep-22 | 11-Jul-22 | | 268.0 | 14.29% |
| MDD3200 | Design for Chemical Plants Equipment | 180.0 | 180.0 | 31-Aug-22 | 26-Feb-23 | | | 55.0 | 0% |
| MDD3320 | Design for WTB Inlet Valve Chamber Equipment | 90.0 | 90.0 | 20-Sep-22 | 18-Dec-22 | | | 230.0 | 0% |
| MDD3340 | Design for Sampling System | 90.0 | 90.0 | 30-Sep-22 | 28-Dec-22 | | | 73.0 | 0% |
| MDD3360 | Design for Service Water Equipment | 90.0 | 90.0 | 30-Oct-22 | 27-Jan-23 | | | 111.0 | 0% |
| MDD3365 | Comments and approval of design for Service Water Equipment | 30.0 | 30.0 | 30-Oct-22 | 28-Nov-22 | | | 317.0 | 0% |
| MDD3380 | Design for Lamella & Supernatant Plant | 90.0 | 90.0 | 31-Aug-22 | 28-Nov-22 | | | 108.0 | 0% |
| MDD3385 | Comments and approval of design for Lamella & Supernatant Plant | 30.0 | 30.0 | 29-Nov-22 | 28-Dec-22 | | | 108.0 | 0% |
| MDD3400 | Design for Electrical system | 120.0 | 120.0 | 30-Oct-22 | 26-Feb-23 | | | 111.0 | 0% |
| MDD3410 | Design for DCS | 90.0 | 90.0 | 30-Sep-22 | 28-Dec-22 | | | 73.0 | 0% |
| MDD3420 | Design for near real-time Operation Simulation System (part of existing facilities) | 60.0 | 42.0 | 11-Jun-22 A | 11-Oct-22 | 11-Jun-22 | | 479.0 | 30% |
| MDD3425 | Comments and approval of design for near real-time Operation Simulation System (part of existing facilities) | 30.0 | 30.0 | 12-Oct-22 | 10-Nov-22 | | | 674.0 | 0% |
| **E&M Deisgn and Associated Interfacing Activities between C&S and E&M Team of SHWRWBPS** | | 90.0 | 67.0 | 08-Aug-22 A | 05-Nov-22 | 08-Aug-22 | | 6.0 | 25.56% |
| MDD3500 | E&M design | 21.0 | 0.0 | 08-Aug-22 A | 27-Aug-22 A | 08-Aug-22 | 27-Aug-22 | | 100% |
| MDD3510 | Input to the BIM for coordination | 14.0 | 11.0 | 28-Aug-22 A | 10-Sep-22 | 28-Aug-22 | | 6.0 | 21.43% |
| MDD3520 | Extract for review, amend to address comments | 14.0 | 14.0 | 11-Sep-22 | 24-Sep-22 | | | 6.0 | 0% |
| MDD3530 | Input for civil works requirement and provisions | 14.0 | 14.0 | 25-Sep-22 | 08-Oct-22 | | | 6.0 | 0% |
| MDD3540 | Review of civil works requirement and provisions | 14.0 | 14.0 | 09-Oct-22 | 22-Oct-22 | | | 6.0 | 0% |
| MDD3550 | Amendment to address comment and issue civil works provisions for construction | 14.0 | 14.0 | 23-Oct-22 | 05-Nov-22 | | | 6.0 | 0% |
| ***Major Temporary Works Design*** | | 212.0 | 120.0 | 22-Apr-22 A | 28-Dec-22 | 22-Apr-22 | | 70.0 | 43.4% |
| MTW0010 | Design for Tower cranes including foundation works | 60.0 | 8.0 | 22-Apr-22 A | 07-Sep-22 | 22-Apr-22 | | 2.0 | 86.67% |
| MTW0020 | ELS design for foundation excavation works for Office and Laboratory Building | 45.0 | 5.0 | 23-May-22 A | 04-Sep-22 | 23-May-22 | | 5.0 | 88.89% |
| MTW0090 | Temporary works design for protection of plant and equipment in Chemical Building | 60.0 | 60.0 | 31-Aug-22 | 29-Oct-22 | | | 70.0 | 0% |
| MTW0095 | ELS design for large diameter water pipes and gate valve chambers | 60.0 | 60.0 | 30-Oct-22 | 28-Dec-22 | | | 70.0 | 0% |
| ***General Submission*** | | 30.0 | 0.0 | 15-Jul-22 A | 29-Aug-22 A | 15-Jul-22 | 29-Aug-22 | | 100% |
| MPW1100 | Submission of the drainage management plan | 30.0 | 0.0 | 15-Jul-22 A | 29-Aug-22 A | 15-Jul-22 | 29-Aug-22 | | 100% |
| ***Material Submission*** | | 210.0 | 150.0 | 05-May-22 A | 27-Jan-23 | 05-May-22 | | 490.0 | 28.57% |
| MAT1030 | Equipment Submission(E&M) | 210.0 | 150.0 | 05-May-22 A | 27-Jan-23 | 05-May-22 | | 490.0 | 28.57% |
| ***BIM Deliverables*** | | 737.0 | 611.0 | 20-May-22 A | 02-May-24 | 20-May-22 | | -7.0 | 17.1% |
| BIMD1010 | Existing Conditions Modelling | 14.0 | 14.0 | 22-Jun-22 A | 13-Sep-22 | 22-Jun-22 | | 59.0 | 0% |




水務署
Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Milestone
Summary

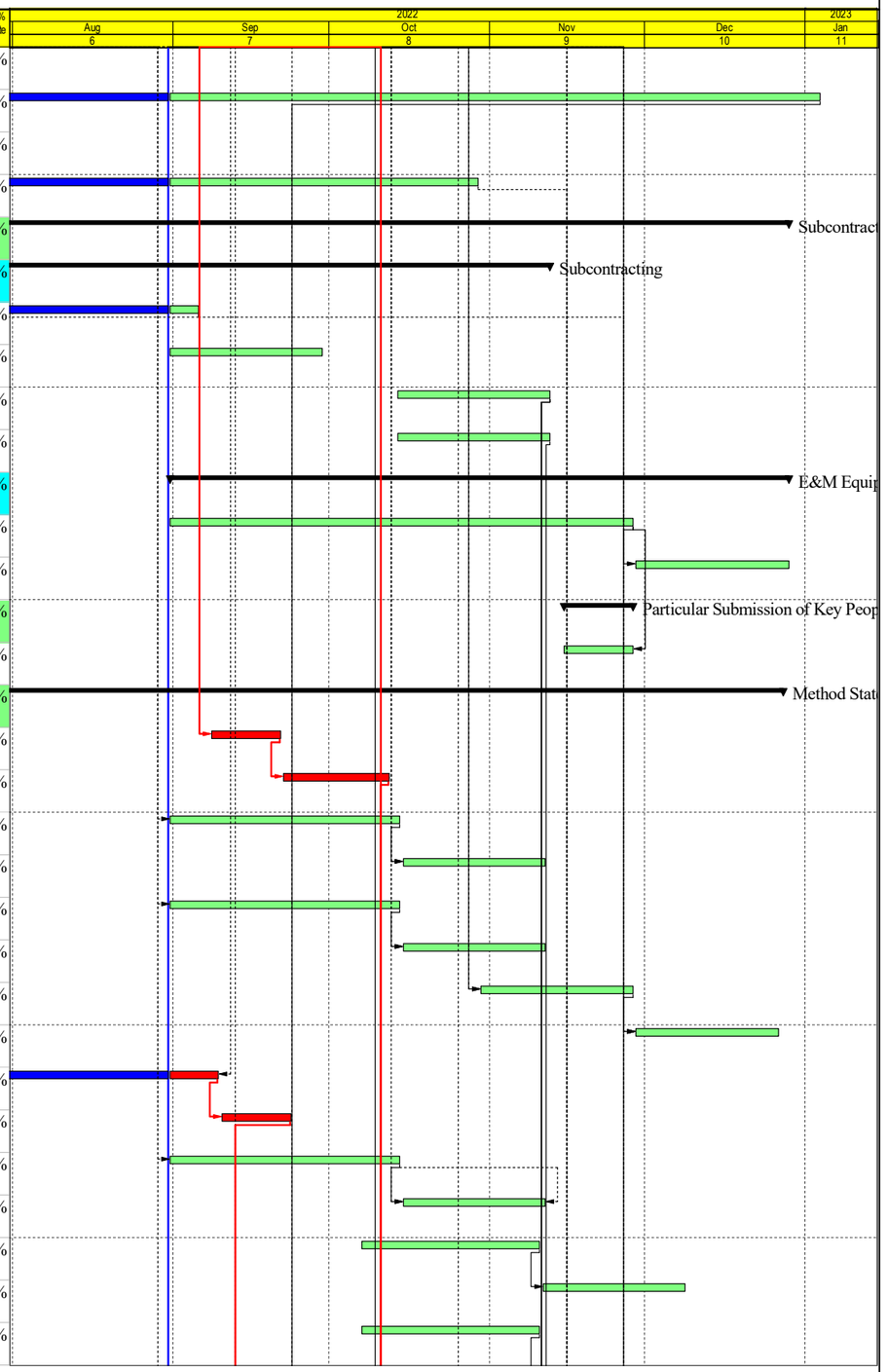
| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| BIMD1020 | BIM Coordinated Models | 447.0 | 383.0 | 21-Jun-22 A | 17-Sep-23 | 21-Jun-22 | | 131.0 | 14.32% |
| BIMD1040 | Combined Service Drawing (CSD) and Combined Builder¡¦s Works Drawings (CBWD) | 190.0 | 126.0 | 24-May-22 A | 03-Jan-23 | 24-May-22 | | 10.0 | 33.68% |
| BIMD1050 | 4D Modelling | 707.0 | 611.0 | 20-May-22 A | 02-May-24 | 20-May-22 | | -7.0 | 13.58% |
| BIMD1060 | BIM Model with Point Cloud(s) Integrated | 120.0 | 60.0 | 30-Jun-22 A | 29-Oct-22 | 30-Jun-22 | | 13.0 | 50% |
| ***Subcontracting and Procurement*** | | 152.0 | 120.0 | 13-Jul-22 A | 28-Dec-22 | 13-Jul-22 | | 133.0 | 21.05% |
| ***Subcontracting*** | | 106.0 | 74.0 | 13-Jul-22 A | 12-Nov-22 | 13-Jul-22 | | 179.0 | 30.19% |
| MTW1565 | Subletting for Precasting works | 45.0 | 6.0 | 13-Jul-22 A | 05-Sep-22 | 13-Jul-22 | | 206.0 | 86.67% |
| MTW1585 | Subletting for waterproofing works | 30.0 | 30.0 | 31-Aug-22 | 29-Sep-22 | | | 69.0 | 0% |
| MTW1600 | Subletting for ABWF works | 30.0 | 30.0 | 14-Oct-22 | 12-Nov-22 | | | 124.0 | 0% |
| MTW1620 | Subletting for Site formation works | 30.0 | 30.0 | 14-Oct-22 | 12-Nov-22 | | | 179.0 | 0% |
| ***E&M Equipment Procurement,FAT and Delivery*** | | 120.0 | 120.0 | 31-Aug-22 | 28-Dec-22 | | | 44.0 | 0% |
| MTW1685 | Submission of Equipment test plan | 90.0 | 90.0 | 31-Aug-22 | 28-Nov-22 | | | 44.0 | 0% |
| MTW1690 | Approval of Equipment test plan | 30.0 | 30.0 | 29-Nov-22 | 28-Dec-22 | | | 44.0 | 0% |
| ***Particular Submission of Key People and Specially Required Staff*** | | 14.0 | 14.0 | 15-Nov-22 | 28-Nov-22 | | | 74.0 | 0% |
| MTW2160 | Approintment of E&M independent inspection body | 14.0 | 14.0 | 15-Nov-22 | 28-Nov-22 | | | 74.0 | 0% |
| ***Method Statement Submission and Approval for Major Construction Works*** | | 181.0 | 119.0 | 27-Jun-22 A | 27-Dec-22 | 27-Jun-22 | | 406.0 | 34.25% |
| MSS2028 | Method statement submission for erection of tower crane | 14.0 | 14.0 | 08-Sep-22 | 21-Sep-22 | | | 2.0 | 0% |
| MSS2029 | Method statement comments and approval for erection of tower crane | 21.0 | 21.0 | 22-Sep-22 | 12-Oct-22 | | | 2.0 | 0% |
| MSS2030 | Method statement submission for structural works for Water Treatment Building | 45.0 | 45.0 | 31-Aug-22 | 14-Oct-22 | | | 173.0 | 0% |
| MSS2035 | Method statement comments and approval for structural works for Water Treatment Building | 28.0 | 28.0 | 15-Oct-22 | 11-Nov-22 | | | 173.0 | 0% |
| MSS2040 | Method statement submission for structural works for Siu Ho Wan Raw Water Booster Pumping Station(SHWRWBPS) | 45.0 | 45.0 | 31-Aug-22 | 14-Oct-22 | | | 26.0 | 0% |
| MSS2045 | Method statement comments and approval for structural works for Siu Ho Wan Raw Water Booster Pumping Station(SHWRWBPS) | 28.0 | 28.0 | 15-Oct-22 | 11-Nov-22 | | | 26.0 | 0% |
| MSS2050 | Method statement submission for executing modifications to the existing Chemical Building | 30.0 | 30.0 | 30-Oct-22 | 28-Nov-22 | | | 147.0 | 0% |
| MSS2055 | Method statement comments and approval for executing modifications to the existing Chemical Building | 28.0 | 28.0 | 29-Nov-22 | 26-Dec-22 | | | 147.0 | 0% |
| MSS2056 | Method statement submission for ELS works for Office and Laboratory Building | 30.0 | 10.0 | 27-Jun-22 A | 09-Sep-22 | 27-Jun-22 | | 0.0 | 66.67% |
| MSS2057 | Method statement comments and approval for Office and Laboratory Building | 14.0 | 14.0 | 10-Sep-22 | 23-Sep-22 | | | 0.0 | 0% |
| MSS2060 | Method statement submission for structural works for Office and Laboratory Building | 45.0 | 45.0 | 31-Aug-22 | 14-Oct-22 | | | 30.0 | 0% |
| MSS2065 | Method statement comments and approval for structural works for Office and Laboratory Building | 28.0 | 28.0 | 15-Oct-22 | 11-Nov-22 | | | 30.0 | 0% |
| MSS2100 | Method statement submission for designing and implementing energy efficiency and optimization for BS | 35.0 | 35.0 | 07-Oct-22 | 10-Nov-22 | | | 342.0 | 0% |
| MSS2105 | Method statement comments and approval for designing and implementing energy efficiency and optimization for BS | 28.0 | 28.0 | 11-Nov-22 | 08-Dec-22 | | | 342.0 | 0% |
| MSS2110 | Method statement submission for modification of Chlorination Building | 35.0 | 35.0 | 07-Oct-22 | 10-Nov-22 | | | 323.0 | 0% |




水務署
Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Milestone
Summary

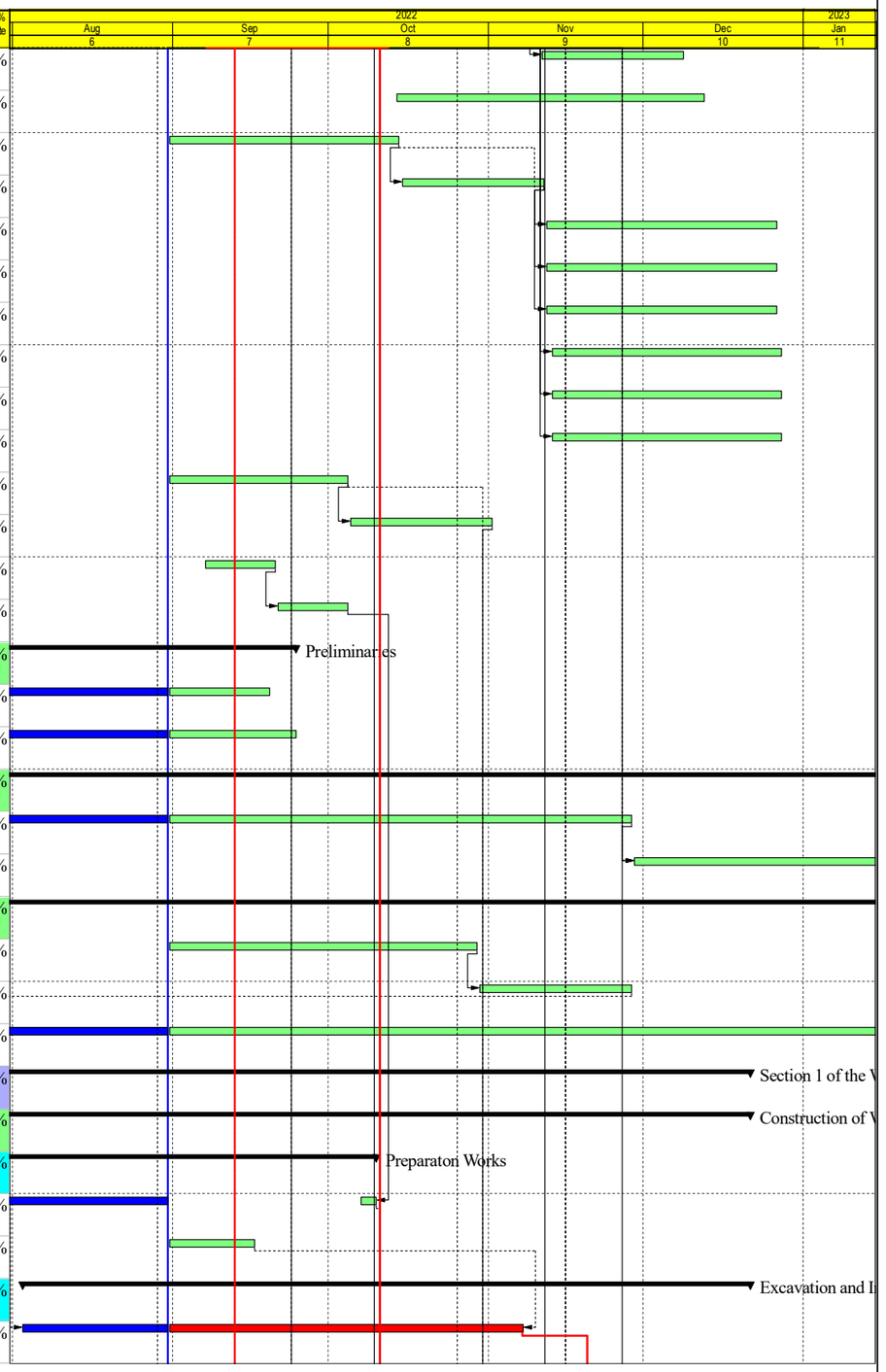
| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| MSS2115 | Method statement comments and approval for modification of Chlorination Building | 28.0 | 28.0 | 11-Nov-22 | 08-Dec-22 | | | 323.0 | 0% |
| MSS2120 | Method statement submission for designing and implementing the proposed Near-Real-Time operation simulation | 60.0 | 60.0 | 14-Oct-22 | 12-Dec-22 | | | 279.0 | 0% |
| MSS2130 | Method statement submission for pipe modification works | 45.0 | 45.0 | 31-Aug-22 | 14-Oct-22 | | | 117.0 | 0% |
| MSS2135 | Method statement comments and approval for pipe modification works | 28.0 | 28.0 | 15-Oct-22 | 11-Nov-22 | | | 117.0 | 0% |
| MSS2210 | Method statement submission for E&M works for water treatment building | 45.0 | 45.0 | 12-Nov-22 | 26-Dec-22 | | | 407.0 | 0% |
| MSS2220 | Method statement submission for E&M works for SHWRWBPS | 45.0 | 45.0 | 12-Nov-22 | 26-Dec-22 | | | 167.0 | 0% |
| MSS2230 | Method statement submission for E&M works for Office and Laboratory Building | 45.0 | 45.0 | 12-Nov-22 | 26-Dec-22 | | | 212.0 | 0% |
| MSS2240 | Method statement submission for ABWF for water treatment building | 45.0 | 45.0 | 13-Nov-22 | 27-Dec-22 | | | 124.0 | 0% |
| MSS2250 | Method statement submission for ABWF for SHWRWBPS | 45.0 | 45.0 | 13-Nov-22 | 27-Dec-22 | | | 124.0 | 0% |
| MSS2260 | Method statement submission for ABWF for Office and Laboratory Building | 45.0 | 45.0 | 13-Nov-22 | 27-Dec-22 | | | 211.0 | 0% |
| MSS2270 | Method statement submission for modification of Washwater System | 35.0 | 35.0 | 31-Aug-22 | 04-Oct-22 | | | 47.0 | 0% |
| MSS2275 | Method statement comments and approval for modification of Washwater System | 28.0 | 28.0 | 05-Oct-22 | 01-Nov-22 | | | 47.0 | 0% |
| MSS2355 | Method statement submission for removal of existing barrack | 14.0 | 14.0 | 07-Sep-22 | 20-Sep-22 | | | 5.0 | 0% |
| MSS2360 | Method statement comments and approval for removal of existing barrack | 14.0 | 14.0 | 21-Sep-22 | 04-Oct-22 | | | 5.0 | 0% |
| ***Preliminaries*** | | 56.0 | 25.0 | 25-Jun-22 A | 24-Sep-22 | 25-Jun-22 | | 248.0 | 55.36% |
| PRE2080 | Erection of contractor's site office | 56.0 | 20.0 | 25-Jun-22 A | 19-Sep-22 | 25-Jun-22 | | 253.0 | 64.29% |
| PRE2090 | Erection of PM's site accommodation (Delay due to PMI-018) | 56.0 | 25.0 | 25-Jun-22 A | 24-Sep-22 | 25-Jun-22 | | 248.0 | 55.36% |
| ***Precasting and Fabrication Works*** | | 302.0 | 300.0 | 27-Jul-22 A | 26-Jun-23 | 27-Jul-22 | | 122.0 | 0.66% |
| PRE2100 | Establishment of Design for Manufacture and Assembly (DfMA)prefabrication yard | 90.0 | 90.0 | 27-Jul-22 A | 28-Nov-22 | 27-Jul-22 | | 62.0 | 0% |
| PRE2120 | Fabrication of DfMA units for structural elements | 210.0 | 210.0 | 29-Nov-22 | 26-Jun-23 | | | 122.0 | 0% |
| ***Interfacing Issues*** | | 178.0 | 150.0 | 05-May-22 A | 27-Jan-23 | 05-May-22 | | 115.0 | 15.73% |
| PRE2150 | Submission of interface management plan | 60.0 | 60.0 | 31-Aug-22 | 29-Oct-22 | | | 33.0 | 0% |
| PRE2160 | Establish interface management liaison groups and site liaison group | 30.0 | 30.0 | 30-Oct-22 | 28-Nov-22 | | | 33.0 | 0% |
| PRE2170 | Establish interface meeting and conformation of interface schedule | 150.0 | 150.0 | 05-May-22 A | 27-Jan-23 | 05-May-22 | | 115.0 | 0% |
| ***Section 1 of the Works*** | | 146.0 | 94.0 | 09-Jul-22 A | 21-Dec-22 | 09-Jul-22 | | 2.0 | 35.62% |
| ***Construction of Water Treatment Building*** | | 146.0 | 94.0 | 09-Jul-22 A | 21-Dec-22 | 09-Jul-22 | | 2.0 | 35.62% |
| ***Preparaton Works*** | | 66.0 | 31.0 | 09-Jul-22 A | 10-Oct-22 | 09-Jul-22 | | 5.0 | 53.03% |
| S110020 | Demolition of existing structure | 14.0 | 2.0 | 09-Jul-22 A | 10-Oct-22 | 09-Jul-22 | | 5.0 | 85.71% |
| S110025 | Demolition of existing lamppost | 14.0 | 14.0 | 31-Aug-22 | 16-Sep-22 | | | 12.0 | 0% |
| ***Excavation and Installation of Lateral Support*** | | 94.0 | 94.0 | 03-Aug-22 A | 21-Dec-22 | 03-Aug-22 | | 2.0 | 0% |
| S110060 | Installation of pre-bored sheet pile wall and king post | 75.0 | 56.0 | 03-Aug-22 A | 07-Nov-22 | 03-Aug-22 | | -5.0 | 25.33% |




水務署
Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Summary
Milestone

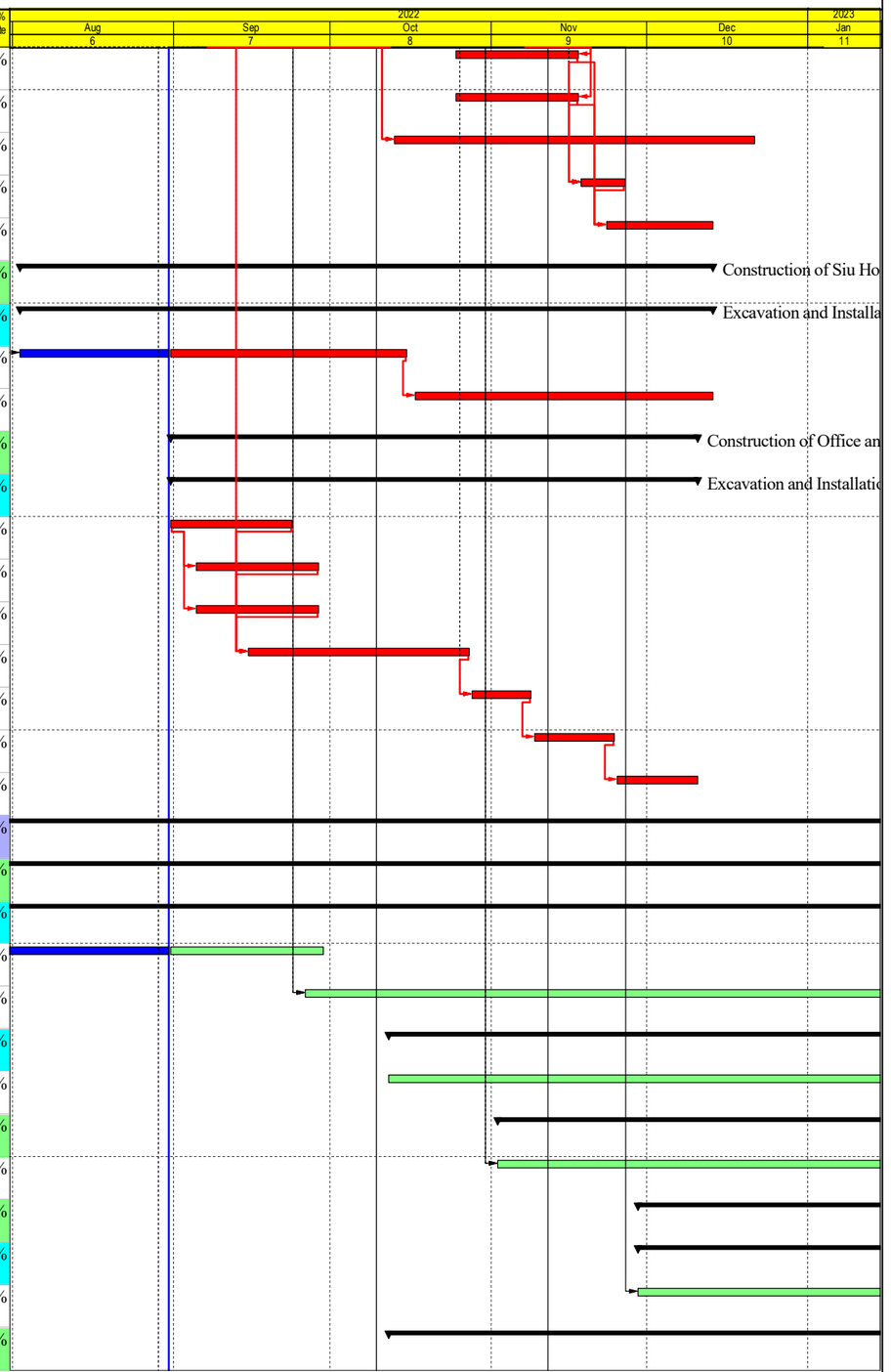
| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| S110065 | Grouting works | 21.0 | 21.0 | 25-Oct-22 | 17-Nov-22 | | | -5.0 | 0% |
| S110080 | Installation of dewatering system | 21.0 | 21.0 | 25-Oct-22 | 17-Nov-22 | | | -5.0 | 0% |
| S110115 | Erection of tower crane including testing | 60.0 | 60.0 | 13-Oct-22 | 21-Dec-22 | | | 2.0 | 0% |
| S110120 | Excavation to +29.5mPD | 8.0 | 8.0 | 18-Nov-22 | 26-Nov-22 | | | -5.0 | 0% |
| S110140 | Installation of 1st layer of waling and strut | 18.0 | 18.0 | 23-Nov-22 | 13-Dec-22 | | | -5.0 | 0% |
| ***Construction of Siu Ho Wan Raw Water Booster Pumping Station and Pipev*** | | 112.0 | 87.0 | 02-Aug-22 A | 13-Dec-22 | 02-Aug-22 | | -5.0 | 22.32% |
| ***Excavation and Installation of Lateral Support*** | | 112.0 | 87.0 | 02-Aug-22 A | 13-Dec-22 | 02-Aug-22 | | -5.0 | 22.32% |
| S110950 | Installation of pre-bore sheetpile wall | 56.0 | 37.0 | 02-Aug-22 A | 15-Oct-22 | 02-Aug-22 | | -5.0 | 33.93% |
| S110985 | Excavation to the formation level | 50.0 | 50.0 | 17-Oct-22 | 13-Dec-22 | | | -5.0 | 0% |
| ***Construction of Office and Laboratory Building*** | | 85.0 | 85.0 | 31-Aug-22 | 10-Dec-22 | | | 0.0 | 0% |
| ***Excavation and Installation of Lateral Support*** | | 85.0 | 85.0 | 31-Aug-22 | 10-Dec-22 | | | 0.0 | 0% |
| S120040 | Demolition of existing ground slab | 20.0 | 20.0 | 31-Aug-22 | 23-Sep-22 | | | 0.0 | 0% |
| S120045 | Cable diversion by others | 20.0 | 20.0 | 05-Sep-22 | 28-Sep-22 | | | 0.0 | 0% |
| S120046 | Diversion of drainage | 20.0 | 20.0 | 05-Sep-22 | 28-Sep-22 | | | 0.0 | 0% |
| S120050 | Installation of sheetpile wall | 35.0 | 35.0 | 15-Sep-22 | 27-Oct-22 | | | 0.0 | 0% |
| S120060 | Excavation to the strut level | 10.0 | 10.0 | 28-Oct-22 | 08-Nov-22 | | | 0.0 | 0% |
| S120065 | Installation of waling and strut | 14.0 | 14.0 | 09-Nov-22 | 24-Nov-22 | | | 0.0 | 0% |
| S120070 | Further excavation down to the formation level | 14.0 | 14.0 | 25-Nov-22 | 10-Dec-22 | | | 0.0 | 0% |
| ***Section 2 of the Works*** | | 768.0 | 706.0 | 15-Jun-22 A | 05-Aug-24 | 15-Jun-22 | | 10.0 | 8.07% |
| ***Water Treatment Building*** | | 768.0 | 706.0 | 15-Jun-22 A | 05-Aug-24 | 15-Jun-22 | | 10.0 | 8.07% |
| ***Statutory Submission schedule*** | | 768.0 | 706.0 | 15-Jun-22 A | 05-Aug-24 | 15-Jun-22 | | 10.0 | 8.07% |
| S210050 | Revised GBP Submission (WTB / O&LB/BPS) | 90.0 | 30.0 | 15-Jun-22 A | 29-Sep-22 | 15-Jun-22 | | 686.0 | 66.67% |
| S210060 | DG (Ozone) installation approval - dwg & layout by FSD for WTB | 680.0 | 680.0 | 26-Sep-22 | 05-Aug-24 | | | 10.0 | 0% |
| ***Mechanical Works*** | | 122.0 | 122.0 | 12-Oct-22 | 10-Feb-23 | | | 5.0 | 0% |
| MDD3390 | Design for Lifting Appliance | 122.0 | 122.0 | 12-Oct-22 | 10-Feb-23 | | | 5.0 | 0% |
| ***Washwater System*** | | 120.0 | 120.0 | 02-Nov-22 | 28-Mar-23 | | | 40.0 | 0% |
| S223620 | Modification of washwater equalization tanks No.1 and No.2 | 120.0 | 120.0 | 02-Nov-22 | 28-Mar-23 | | | 40.0 | 0% |
| ***Chemical Building*** | | 90.0 | 90.0 | 29-Nov-22 | 20-Mar-23 | | | 89.0 | 0% |
| ***Equipment Procurement, Manufacture, FAT and Delivery*** | | 90.0 | 90.0 | 29-Nov-22 | 20-Mar-23 | | | 89.0 | 0% |
| S223710 | Equipment manufacture,FAT and delivery | 90.0 | 90.0 | 29-Nov-22 | 20-Mar-23 | | | 89.0 | 0% |
| ***Siu Ho Wan Pumping Station*** | | 180.0 | 180.0 | 12-Oct-22 | 22-May-23 | | | 287.0 | 0% |




水務署
Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Milestone
Summary

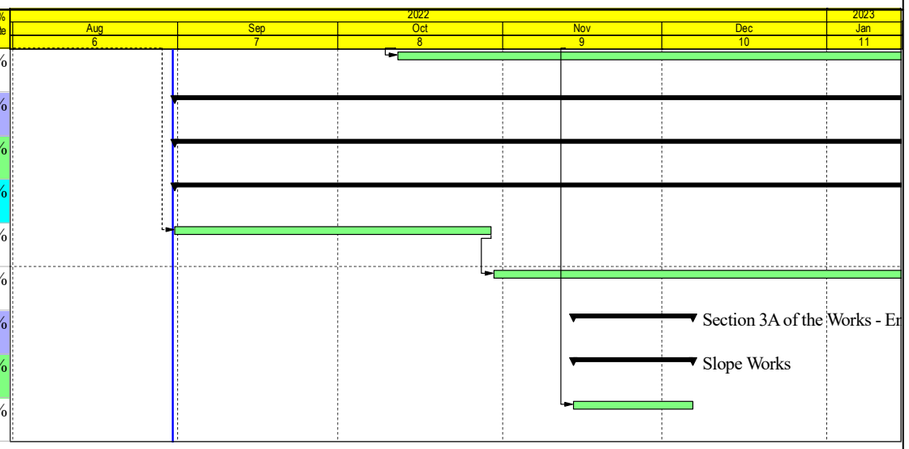
| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

# Contract No. 7/WSD/21 Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping

Data Date:31-Aug-22

| Activity ID | Activity Name | Duration | Remaining Duration | Start | Finish | Actual Start | Actual Finish | Total Float | Duration % Complete |
|---|---|---|---|---|---|---|---|---|---|
| S224050 | Modification of backwash pump to stream IIA SRGF | 180.0 | 180.0 | 12-Oct-22 | 22-May-23 | | | 287.0 | 0% |
| ***Section 3 of the Works*** | | 330.0 | 330.0 | 31-Aug-22 | 26-Jul-23 | | | 193.0 | 0% |
| ***Siu Ho Wan Raw Water Booster Pumping Station*** | | 330.0 | 330.0 | 31-Aug-22 | 26-Jul-23 | | | 193.0 | 0% |
| ***Equipment Procurement, Manufacture, FAT and Delivery*** | | 330.0 | 330.0 | 31-Aug-22 | 26-Jul-23 | | | 193.0 | 0% |
| S312000 | Procurement of process and E&M equipment | 60.0 | 60.0 | 31-Aug-22 | 29-Oct-22 | | | 193.0 | 0% |
| S312020 | Manufacture,FAT and delivery of process and E&M equipment | 270.0 | 270.0 | 30-Oct-22 | 26-Jul-23 | | | 193.0 | 0% |
| ***Section 3A of the Works - Entrustment Works*** | | 20.0 | 20.0 | 14-Nov-22 | 06-Dec-22 | | | 142.0 | 0% |
| ***Slope Works*** | | 20.0 | 20.0 | 14-Nov-22 | 06-Dec-22 | | | 142.0 | 0% |
| S3A1005 | Replacement of existing fill by no-file concrete for slope 10NW-C/C43 | 20.0 | 20.0 | 14-Nov-22 | 06-Dec-22 | | | 142.0 | 0% |




水務署
Water Supplies Department

中國路橋 CRBC

Actual Work
Non-Critical Activity
Critical Activity
Milestone
Summary

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 31-Aug-22 | 0 | CLX | WIM |

**3 Month Rolling Programme - Sep to Nov 2022**

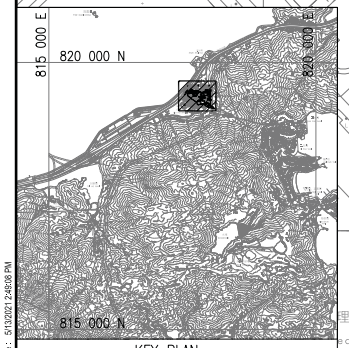
# Appendix D

# Monitoring Locations

LEGEND:

- SITE BOUNDARY
- PROPOSED RAW WATER MAINS (BURIED)
- PROPOSED RAW WATER MAINS (EXPOSED)
- PROPOSED FENCING
- PROPOSED BUILDING WORKS

NOTE1:
THE EXISTING WASHWATER EQUALIZATION TANKS TO BE RENAMED AS "THICKENER FEED TANKS"


KEY PLAN
A1 1 : 50000

| Revision | Date | Description | Initial |
|---|---|---|---|
| 0 | 05/21 | ISSUE FOR TENDER DRAWING | JC |

| | Designed | Checked | Drawn | Checked |
|---|---|---|---|---|
| Initial | CT/CCK | YFC/AS | SZ | JC |
| Date | 05/21 | 05/21 | 05/21 | 05/21 |

Approved
James Chan

Contract No.
7/WSD/21

Contract Title
CONSTRUCTION OF SIU HO WAN WATER TREATMENT WORKS EXTENSION AND SIU HO WAN RAW WATER BOOSTER PUMPING STATION

Drawing Title
SITE LOCATION

Drawing No.
199755A/B&V/GN/00001

Revision
0

Scale
A1 1 : 750
A3 1 : 1500

水務署
Water Supplies Department

BINNIES HONG KONG LIMITED
賓尼新工程顧問有限公司

Plot Date : 5/13/2021 12:45:05 PM

File Name : Y:\Daily Work\02 From other HK Projects\199755 -Tender Drawing\DWG\199755A-B&V-GN-00001

# Appendix E

# Calibration Certificates

# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Siu Ho Wan WTW Administration
Location ID : SHWAB
Name and Model: TISCH HVS Model TE-5170

Date of Calibration: 29-Sep-22
Next Calibration Date: 29-Nov-22
Technician: Eric

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa) | 1012.3 | Corrected Pressure (mm Hg) | 759.225 |
| Temperature (°C) | 26.4 | Temperature (K) | 299 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make-> | TISCH | Qstd Slope -> | 1.99838 |
| Model-> | 5025A | Qstd Intercept -> | -0.00903 |
| Serial # -> | 1612 | | |

## CALIBRATION

| Plate No. | H20 (L) (in) | H2O (R) (in) | H20 (in) | Qstd (m3/min) | I (chart) | IC corrected | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 5.60 | 5.60 | 11.2 | 1.674 | 56 | 55.71 | Slope = 30.7320 |
| 13 | 4.40 | 4.40 | 8.8 | 1.485 | 51 | 50.74 | Intercept = 5.0803 |
| 10 | 3.30 | 3.30 | 6.6 | 1.286 | 46 | 45.76 | Corr. coeff. = 0.9957 |
| 7 | 2.30 | 2.30 | 4.6 | 1.075 | 39 | 38.80 | |
| 5 | 1.40 | 1.40 | 2.8 | 0.839 | 30 | 29.84 | |

***Calculations :***

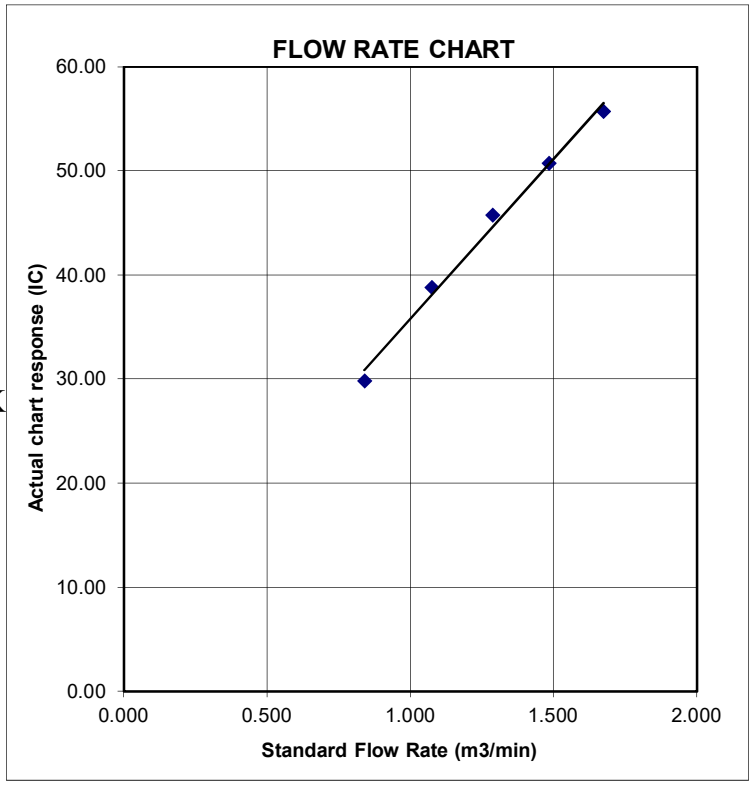
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration ( deg K
Pstd = actual pressure during calibration ( mm Hg

***For subsequent calculation of sampler flow:***

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| December 27, 2022 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | December 27, 2021 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 740.4 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **1612** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.3890 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 0.9760 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.8740 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8320 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.6870 | 12.7 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9799 | 0.7055 | 1.4029 | 0.9957 | 0.7168 | 0.8927 |
| 0.9756 | 0.9996 | 1.9841 | 0.9914 | 1.0157 | 1.2624 |
| 0.9736 | 1.1140 | 2.2183 | 0.9893 | 1.1320 | 1.4114 |
| 0.9724 | 1.1688 | 2.3265 | 0.9881 | 1.1876 | 1.4803 |
| 0.9673 | 1.4079 | 2.8059 | 0.9828 | 1.4306 | 1.7853 |
| **QSTD** | **m=** | **1.99838** | **QA** | **m=** | **1.25135** |
| | **b=** | **-0.00903** | | **b=** | **-0.00574** |
| | **r=** | **0.99999** | | **r=** | **0.99999** |

| Calculations | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

**RECALIBRATION**

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-900

# Appendix F

# Event and Action Plan

**Event Action Plan for Air Quality**

| Event | Action | | | |
|---|---|---|---|---|
| | **ET** | **IEC** | ***PM*D** | ***Contractor*** |
| Action Level exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC, *PM*D and *Contractor*;<br>3. Repeat measurement to confirm finding; and<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check *Contractor*'s working method; and<br>3. Review and advise the ET and *PM*D on the effectiveness of the proposed remedial measures. | 1. Notify *Contractor*. | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Rectify any unacceptable practice and implement remedial measures; and<br>3. Amend working methods agreed with *PM*D if appropriate. |
| Action Level exceedance for two or more consecutive samples | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC, *PM*D and *Contractor*;<br>3. Advise the *PM*D and *Contractor* on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC, *PM*D and *Contractor* on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and *PM*D; and<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check *Contractor*'s working method;<br>3. Discuss with ET and *Contractor* on possible remedial measures;<br>4. Advise the ET and *PM*D on the effectiveness of the proposed remedial measures; and<br>5. Supervise Implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify *Contractor*; and<br>3. Supervise and ensure remedial measures properly implemented. | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Submit proposals for remedial actions to *PM*D with a copy to ET and IEC within 3 working days of notification;<br>3. Implement the agreed proposals; and<br>4. Amend proposal if appropriate. |
| Limit Level exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform *PM*D, *Contractor*, IEC and EPD; | 1. Check monitoring data submitted by ET;<br>2. Check *Contractor*'s working method;<br>3. Discuss with ET, *PM*D and *Contractor* on possible remedial | 1. Confirm receipt of notification of failure in writing;<br>2. Notify *Contractor*; and<br>3. Supervise and ensure remedial measures properly implemented. | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Take immediate action to avoid further exceedance; |

| | | | | |
|---|---|---|---|---|
| | 3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of *Contractor*'s remedial actions and keep IEC, EPD and *PM*D informed of the results. | measures;<br>4. Advise the *PM*D and ET on the effectiveness of the proposed remedial measures;<br>5. Supervise implementation of remedial measures. | | 3. Submit proposals for remedial actions to *PM*D with a copy to ET and IEC within 3 working days of notification;<br>4. Implement the agreed proposals; and<br>5. Amend proposal if appropriate. |
| Limit Level exceedance for two or more consecutive samples | 1. Notify IEC, *PM*D, *Contractor* and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of *Contractor*'s working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC, *Contractor* and *PM*D to discuss the remedial actions to be taken;<br>7. Assess effectiveness of *Contractor*'s remedial actions and keep IEC, EPD and *PM*D informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check *Contractor*'s working method;<br>3. Discuss amongst *PM*D, ET, and *Contractor* on the potential remedial actions;<br>4. Review *Contractor*'s remedial actions whenever necessary to assure their effectiveness and advise the *PM*D accordingly; and<br>5. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify *Contractor*;<br>3. In consultation with the ET and IEC, agree with the *Contractor* on the remedial measures to be implemented;<br>4. Supervise and ensure remedial measures properly implemented; and<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the *Contractor* to stop that portion of work until the exceedance is abated. | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Take immediate action to avoid further exceedance;<br>3. Submit proposals for remedial actions to *PM*D with a copy to ET and IEC within 3 working days of notification;<br>4. Implement the agreed proposals;<br>5. Resubmit proposals if problem still not under control;<br>6. Stop the relevant portion of works as determined by the *PM*D until the exceedance is abated. |

Note:
ET – Environmental Team
IEC – Independent Environmental Checker
*PM*D – *Project Manager*'s Delegate

# Appendix G

# Monitoring Schedule

## Impact Air Quality Monitoring Schedule for the Reporting Period

| Date | | Air Quality Monitoring (24-Hour TSP) |
|---|---|---|
| Tue | 1-Nov-22 | |
| Wed | 2-Nov-22 | |
| Thu | 3-Nov-22 | |
| Fri | 4-Nov-22 | ✓ |
| Sat | 5-Nov-22 | |
| Sun | 6-Nov-22 | |
| Mon | 7-Nov-22 | |
| Tue | 8-Nov-22 | |
| Wed | 9-Nov-22 | |
| Thu | 10-Nov-22 | ✓ |
| Fri | 11-Nov-22 | |
| Sat | 12-Nov-22 | |
| Sun | 13-Nov-22 | |
| Mon | 14-Nov-22 | |
| Tue | 15-Nov-22 | |
| Wed | 16-Nov-22 | ✓ |
| Thu | 17-Nov-22 | |
| Fri | 18-Nov-22 | |
| Sat | 19-Nov-22 | |
| Sun | 20-Nov-22 | |
| Mon | 21-Nov-22 | |
| Tue | 22-Nov-22 | ✓ |
| Wed | 23-Nov-22 | |
| Thu | 24-Nov-22 | |
| Fri | 25-Nov-22 | |
| Sat | 26-Nov-22 | |
| Sun | 27-Nov-22 | |
| Mon | 28-Nov-22 | ✓ |
| Tue | 29-Nov-22 | |
| Wed | 30-Nov-22 | |

| | |
|---|---|
| ✓ | Monitoring Day |
| | Sunday or Public Holiday |

## Impact Air Quality Monitoring Schedule for next Reporting Period

| Date | | Air Quality Monitoring (24-Hour TSP) |
|---|---|---|
| Thu | 1-Dec-22 | |
| Fri | 2-Dec-22 | |
| Sat | 3-Dec-22 | ✓ |
| Sun | 4-Dec-22 | |
| Mon | 5-Dec-22 | |
| Tue | 6-Dec-22 | |
| Wed | 7-Dec-22 | |
| Thu | 8-Dec-22 | |
| Fri | 9-Dec-22 | ✓ |
| Sat | 10-Dec-22 | |
| Sun | 11-Dec-22 | |
| Mon | 12-Dec-22 | |
| Tue | 13-Dec-22 | |
| Wed | 14-Dec-22 | |
| Thu | 15-Dec-22 | ✓ |
| Fri | 16-Dec-22 | |
| Sat | 17-Dec-22 | |
| Sun | 18-Dec-22 | |
| Mon | 19-Dec-22 | |
| Tue | 20-Dec-22 | |
| Wed | 21-Dec-22 | ✓ |
| Thu | 22-Dec-22 | |
| Fri | 23-Dec-22 | |
| Sat | 24-Dec-22 | ✓ |
| Sun | 25-Dec-22 | |
| Mon | 26-Dec-22 | |
| Tue | 27-Dec-22 | |
| Wed | 28-Dec-22 | |
| Thu | 29-Dec-22 | |
| Fri | 30-Dec-22 | ✓ |
| Sat | 31-Dec-22 | |

| | |
|---|---|
| ✓ | Monitoring Day |
| | Sunday or Public Holiday |

# Appendix H

# Database of Monitoring Result

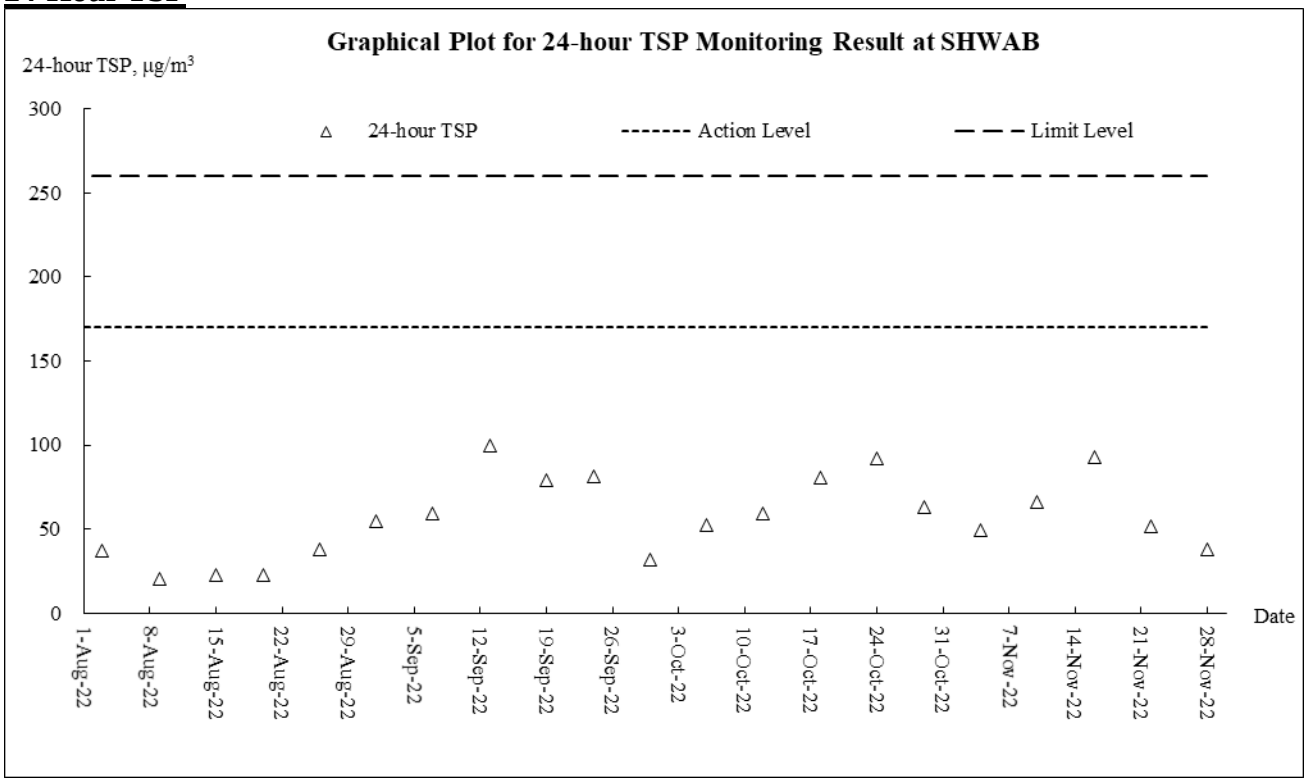
**Impact Monitoring Results for 24-hour TSP at SHWAB**

| DATE | SAMPLE NUMBER | ELAPSED TIME | | ACTUAL (min) | CHART READING | | | AVG TEMP (℃) | STANDARD | | | FILTER WEIGHT (g) | | WEIGHT DUST COLLECTED (g) | DUST 24-hour TSP IN AIR (ug/m$^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | INITIAL | FINAL | | MIN | MAX | AVG | | AVG PRESS (hPa) | FLOW RATE (m$^3$/min) | AIR VOLUME (std m$^3$) | INITIAL | FINAL | | |
| 4-Nov-22 | 28876 | 18767.10 | 18791.10 | 1440.00 | 32 | 32 | 32.0 | 22.6 | 1016.3 | 0.88 | 1270 | 2.6112 | 2.6741 | 0.0629 | 50 |
| 10-Nov-22 | 28890 | 18791.10 | 18815.10 | 1440.00 | 34 | 34 | 34.0 | 24.8 | 1016.7 | 0.94 | 1358 | 2.5923 | 2.6823 | 0.0900 | 66 |
| 16-Nov-22 | 28901 | 18815.10 | 18839.10 | 1440.00 | 34 | 34 | 34.0 | 24.1 | 1015 | 0.94 | 1359 | 2.6694 | 2.7957 | 0.1263 | 93 |
| 22-Nov-22 | 28922 | 18839.10 | 18863.11 | 1440.60 | 34 | 34 | 34.0 | 23.4 | 1013.1 | 0.94 | 1360 | 2.6925 | 2.7625 | 0.0700 | 51 |
| 28-Nov-22 | 28918 | 18863.11 | 18887.11 | 1440.00 | 32 | 32 | 32.0 | 25.6 | 1012.5 | 0.87 | 1259 | 2.6744 | 2.7219 | 0.0475 | 38 |

# Appendix I

# Graphical Plots for Monitoring Result

## 24-Hour TSP


Graphical Plot for 24-hour TSP Monitoring Result at SHWAB
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
Date
1-Aug-22
8-Aug-22
15-Aug-22
22-Aug-22
29-Aug-22
5-Sep-22
12-Sep-22
19-Sep-22
26-Sep-22
3-Oct-22
10-Oct-22
17-Oct-22
24-Oct-22
31-Oct-22
7-Nov-22
14-Nov-22
21-Nov-22
28-Nov-22

# Appendix J

# Meteorological Data

| Date | | Weather | Total Rainfall (mm) | Chek Lap Kok | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Mean Air Temp. (°C) | Wind Speed (km/h) | Mean Relative Humidity (%) | Wind Direction | Mean Press. (hPa) |
| 1-Nov-22 | Tue | Mainly cloudy with a few showers. | 4.5 | 22.4 | 19.5 | 61.7 | N/NE | 1008.2 |
| 2-Nov-22 | Wed | Cloudy with a few showers. | 23.7 | 20.0 | 17 | 82.0 | N/NE | 1007.0 |
| 3-Nov-22 | Thu | Moderate to fresh easterly winds. | 58.1 | 22.3 | 31.5 | 84.7 | E/SE | 1012.0 |
| 4-Nov-22 | Fri | Mainly cloudy with one or two showers. | 4 | 23.9 | 16.7 | 83.7 | E | 1016.3 |
| 5-Nov-22 | Sat | Moderate to fresh east to northeasterly winds | Trace | 21.2 | 13.5 | 81.0 | NE | 1019.0 |
| 6-Nov-22 | Sun | Mainly cloudy.Moderate northeasterly winds. | 6.6 | 20.4 | 13.5 | 82.5 | NE | 1018.6 |
| 7-Nov-22 | Mon | One or two rain patches in the morning | 1.6 | 20.9 | 9 | 85.0 | NE | 1017.3 |
| 8-Nov-22 | Tue | Mainly cloudy with one or two showers. | 7.7 | 21.8 | 11.2 | 86.2 | NE | 1017.3 |
| 9-Nov-22 | Wed | Moderate to fresh east to northeasterly winds. | 0 | 24.3 | 9.2 | 74.0 | E/NE | 1017.3 |
| 10-Nov-22 | Thu | Mainly fine.Moderate east to northeasterly winds. | 0 | 25.3 | 14 | 72.2 | E | 1016.7 |
| 11-Nov-22 | Fri | Mainly fine. Moderate easterly winds. | 0 | 26.5 | 14.2 | 69.7 | E | 1016.2 |
| 12-Nov-22 | Sat | Mainly fine. Moderate easterly winds. | Trace | 25.2 | 9.5 | 68.2 | E | 1015.3 |
| 13-Nov-22 | Sun | Mainly cloudy. Sunny periods in the afternoon. | 0 | 25.5 | 10.0 | 71.2 | E/NE | 1015.7 |
| 14-Nov-22 | Mon | Moderate to fresh easterly winds. | 0 | 25.6 | 20.7 | 66.2 | E | 1016.7 |
| 15-Nov-22 | Tue | Sunny periods. Moderate easterly winds | 0 | 26.2 | 15.0 | 68.2 | E | 1015.5 |
| 16-Nov-22 | Wed | Sunny periods in the afternoon. | 0 | 25.7 | 19 | 68.2 | E | 1015.0 |
| 17-Nov-22 | Thu | Mainly cloudy. Sunny periods in the afternoon. | 0 | 25.6 | 17.5 | 72.0 | E/NE | 1014.6 |
| 18-Nov-22 | Fri | Sunny periods in the afternoon. Moderate easterly winds. | 0 | 26.0 | 16.2 | 71.0 | E/NE | 1015.6 |
| 19-Nov-22 | Sat | Moderate to fresh easterly winds. | 0 | 26.8 | 13 | 65.0 | E/NE | 1015.0 |
| 20-Nov-22 | Sun | Sunny periods in the afternoon. | 0 | 26.0 | 15 | 67.0 | E/NE | 1014.0 |
| 21-Nov-22 | Mon | Moderate to fresh easterly winds | 0.5 | 25.0 | 18 | 72.2 | E/NE | 1013.6 |
| 22-Nov-22 | Tue | Cloudy with a few showers. | 2.5 | 24.6 | 22.5 | 78.7 | E | 1013.1 |
| 23-Nov-22 | Wed | Cloudy with a few rain patches. | 3.4 | 24.7 | 20 | 85.0 | E | 1013.8 |
| 24-Nov-22 | Thu | Moderate east to northeasterly winds | 9.6 | 22.7 | 23 | 86.0 | E | 1015.2 |
| 25-Nov-22 | Fri | Mainly cloudy with one or two rain patches. | 4.8 | 23.9 | 17.2 | 83.0 | E/NE | 1015.6 |
| 26-Nov-22 | Sat | Mainly cloudy with one or two rain patches. | 0.5 | 23.2 | 15 | 84.0 | E/NE | 1014.8 |
| 27-Nov-22 | Sun | Rather warm with sunny periods during the day. | 1.9 | 24.8 | 23.5 | 81.0 | E/NE | 1012.6 |
| 28-Nov-22 | Mon | Mainly cloudy. A few rain patches at first. | 1.4 | 26.6 | 13.7 | 80.7 | SE | 1012.5 |
| 29-Nov-22 | Tue | Mainly fine. Hot in the afternoon. | 0 | 27.6 | 14.5 | 71.7 | E | 1013.5 |
| 30-Nov-22 | Wed | Mainly cloudy with one or two rain patches. | 0 | 21.8 | 13.7 | 77.5 | NE | 1017.3 |

*Remark: The above information was extracted from the Hong Kong Observatory Station of Chek Lap Kok of below link: https://www.hko.gov.hk/en/index.html*

# Appendix K

# Waste Flow Table

# Monthly Summary Waste Flow Table for _2022__ (year)

Project : Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station Contract No.: 7/WSD/21

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete (a) (see Note 3) | Reused in the Contract (b) | Reused in other Projects (c) | Disposed as Public Fill (d) | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 2) | Chemical Waste | Others, e.g. general refuse |
| | (in Tonne) | (in Tonne) | (in Tonne) | (in Tonne) | (in Tonne) | (in Tonne) | (in '000 kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in Tonne) |
| Jan | | | | | | | | | | | |
| Feb | | | | | | | | | | | |
| Mar | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Apr | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| May | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.160 |
| Jun | 94.000 | 0.000 | 0.000 | 0.000 | 94.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 207.370 |
| Sub-total | 94.000 | 0.000 | 0.000 | 0.000 | 94.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 208.530 |
| Jul | 693.250 | 0.000 | 0.000 | 0.000 | 693.250 | 0.000 | 5.890 | 0.000 | 0.000 | 0.000 | 9.420 |
| Aug | 93.410 | 0.000 | 0.000 | 0.000 | 93.410 | 0.000 | 13.990 | 0.000 | 0.000 | 0.000 | 7.910 |
| Sep | 3985.890 | 0.000 | 0.000 | 0.000 | 3985.890 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.480 |
| Oct | 27.110 | 0.000 | 0.000 | 0.000 | 27.110 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 70.990 |
| Nov | 6598.800 | 0.000 | 0.000 | 0.000 | 6598.800 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 37.250 |
| Dec | | | | | | | | | | | |
| Total | 11492.460 | 0.000 | 0.000 | 0.000 | 11492.460 | 0.000 | 19.880 | 0.000 | 0.000 | 0.000 | 337.580 |

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.
(3) Broken concrete for recycling into aggregates.
(4) Total Quantity Gernerated = a+b+c+d.

# Appendix L

# Environmental Complaints Log

## Environmental Complaints Log

| Log ref. | Date of complaint | Complaint route | Reference no. | Complaint nature | Investigation fining | Status |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

# Appendix M

# Implementation Schedule for Environmental Mitigation Measures

# Environmental Mitigation Implementation Schedule for Air Quality Control

| EIA Ref | Environmental Protection Measures | Location/Timing | Implementation Agent | Implementation Stages* | | | Relevant Legislation & Guidelines |
|---|---|---|---|---|---|---|---|
| | | | | D | C | O | |
| **Construction Phase (Air Quality Control)** | | | | | | | |
| S3.8 | Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work. Relevant control measures include:<br>• watering on the work sites at Siu Ho Wan WTW twice a day;<br>• skip hoist for material transport shall be totally enclosed by impervious sheeting;<br>• vehicle washing facilities shall be provided at every vehicle exit point;<br>• the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores;<br>• every main haul road shall be scaled with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet;<br>• every stock of more than 20 bags of cement shall be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides;<br>• all dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;<br>• every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the construction sites;<br>• the dusty materials stockpiled on site shall be covered; and<br>• the load of dusty materials carried by vehicle leaving a construction site shall be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle. | Work site / during construction period. | *Contractor* | | √ | | Air Pollution Control (Construction Dust) Regulation |
| **Operation Phase(Air Quality)** | | | | | | | |
| NA | NA | NA | NA | NA | NA | NA | NA |
| **Construction Phase (Noise Control)** | | | | | | | |
| S4.8.1 | Use of silenced PME | Work site close to all NSRs | *Contractor* | | √ | | NCO, EIAO-TM |
| S4.8.6 | Good Site Practices:<br>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.<br>• Mobile plant, if any, should be sited as far away from NSRs as possible.<br>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.<br>• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.<br>• Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.<br>• Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction programme. | Work site close to all NSRs / throughout the construction period. | *Contractor* | | √ | | NCO, EIAO-TM |

| EIA Ref | Environmental Protection Measures | Location/Timing | Implementation Agent | Implementation Stages* | | | Relevant Legislation & Guidelines |
|---|---|---|---|---|---|---|---|
| | | | | D | C | O | |
| **Operation Phase(Noise Control)** | | | | | | | |
| NA | NA | NA | NA | NA | NA | NA | NA |
| **Construction Phase (Water Quality Control)** | | | | | | | |
| S5.7.2 | *Construction Site Runoff and Drainage*<br>• Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.<br>• Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.<br>• Water pumped out from foundation excavations shall be discharged into silt removal facilities.<br>• Exposed soil surfaces shall be protected by paving or fill material as soon as possible to reduce the potential of soil erosion.<br>• Open stockpiles of construction materials or construction wastes on-site of more than 50m3 shall be covered with tarpaulin or similar fabric during rainstorms. | Work site / During the construction period | *Contractor* | | √ | | ProPECC PN 1/94; WPCO |
| S5.7.3 | *General Construction Activities*<br>• Debris and rubbish generated on-site shall be collected, handled and disposed of properly to avoid entering the nearby watercourses and storm water drains. Stockpiles of cement and other construction materials shall be kept covered when not being used. | Work site / During the construction period | *Contractor* | | √ | | ProPECC PN 1/94; WPCO |
| S5.7.4 | • Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event. | Work site / During the construction period | *Contractor* | | √ | | |
| S5.7.5 | *Sewage from Construction Workforce*<br>• Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site. A licensed contractor shall be responsible for appropriate disposal and maintenance of these facilities. | Work site / During the construction period | *Contractor* | | √ | | WPCO |
| **Operation Phase(Water Quality Control)** | | | | | | | |
| NA | NA | NA | NA | NA | NA | NA | NA |
| **Construction Phase (Ecology)** | | | | | | | |
| S.6.9.3 | *Mitigation to minimise impacts on vegetation in woodland*<br>• All trees shall be preserved as far as possible, especially species of high conservation or amenity value. Recommendations to be provided in the Tree Survey Report to mitigate impacts on trees shall be followed. Where trees are to be preserved in-situ, but are likely to be disturbed from works activities, protective fencing/hoarding shall be carefully set up around the affected trees (refer to | Work site particularly woodland / During design phase and construction period | WSD/ *Contractor* | √ | √ | | EIAO |

| EIA Ref | Environmental Protection Measures | Location/Timing | Implementation Agent | Implementation Stages* | | | Relevant Legislation & Guidelines |
|---|---|---|---|---|---|---|---|
| | | | | D | C | O | |
| S.6.9.4/ S.6.11.2 | Landscape and Visual).<br>• Disturbance of individuals of the shrub/tree species Pavetta hongkongensis and tree Aquilaria sinensis of conservation interest should be avoided. A buffer to the dripline of each plant of at least 1m radius should be demarcated to prohibit disturbance. Where loss of this species would be unavoidable, it is recommended that these plants may be transplanted to safe locations within the same habitat. Following transplantation, regular monitoring of the trees and seedlings should be conducted by a suitably qualified botanist/horticulturist over a 12-month period. | | | | | | |
| S.6.9.5 | *Mitigation to minimise impacts on aquatic ecology*<br>• Trench excavation works for the raw water mains near the stream courses should be carried out in the dry season as far as practicable. | Work site / During construction period | WSD/ *Contractor* | √ | √ | | |
| S.6.9.6 | *Mitigation to minimise general disturbance to wildlife*<br>• Noise mitigation measures through the use of quiet construction plant shall be implemented to minimise disturbance to habitats adjacent to the works areas. | Work site / During construction period | *Contractor* | | √ | | EIAO |
| S.6.9.7 | *General good site practice*<br>• Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats.<br>• Construction activities shall be restricted to works areas that shall be clearly demarcated. The works areas shall be reinstated after completion of the works.<br>• Waste skips shall be provided to collect general refuse and construction wastes. The wastes shall be disposed of timely and properly off-site.<br>• General drainage arrangements shall include sediment and oil traps to collect and control construction site run-off.<br>• Open burning on works sites is illegal, and shall be strictly prohibited. Stove fires on works sites shall also not be allowed. Temporary fire fighting equipment shall be provided particularly in woodland areas. | Work site / During construction period | *Contractor* | | √ | | EIAO |
| S.6.9.8. | *Re-vegetation to reinstate works areas*<br>• As far as possible compensatory planting shall use native plants of the same species that occur in the adjacent woodland habitat and have flowers/fruits attractive to wildlife. On-site compensatory planting should be conducted on at least a one to one basis. | Work site in woodland / Immediately following works | *Contractor* | | √ | | EIAO |
| **Operation Phase(Ecology)** | | | | | | | |
| NA | NA | NA | NA | NA | NA | NA | NA |
| **Construction Phase (Landscape and Visual Impact)** | | | | | | | |
| S7.9 | • All existing top-soil shall be conserved and reused<br>• Temporary hoarding barriers shall be of a recessive visual appearance in both colour and form.<br>• Chromatic colour scheme with appropriate texture should be considered while designing the external surface of the proposed SHW Raw Water Booster Pumping Station in order to visually merge the proposed structures into the surrounding landscape. | During construction phase | *Contractor* | | √ | | EIAO-TM |
| **Operation Phase(Landscape and Visual Impact)** | | | | | | | |

| EIA Ref | Environmental Protection Measures | Location/Timing | Implementation Agent | Implementation Stages* | | | Relevant Legislation & Guidelines |
|---|---|---|---|---|---|---|---|
| | | | | D | C | O | |
| S7.9 | • New compensatory planting works shall be carried out as early as possible in the construction period which allow maximum time for establishment and more mature trees when the works completed.<br>• Landscape or compensatory planting shall be provided where appropriate for enhancing greening and achieving visual screening. In this aspect, compensatory tree planting shall be considered. Selection of plant species shall match with the surrounding vegetation type and form for consistency of landscape resources and visual comfort, for matching with the local habitat. Tree planting shall be firstly considered when the amenity area or slope is feasible for planting trees so as to provide visual screening. | During operation phase | *Contractor* | | | √ | EIAO-TM |
| S7.9 | • Planting area of approximately 2000 to 3000mm wide where fast growing tall trees with dense foliage shall be provided along the site boundary of Siu Ho Wan Raw Water Booster Pumping Station for visual screening.<br>• For planting close to or surrounded by natural terrain, compensatory planting should be arranged in a semi natural manner where feasible in order to blend the new planting into natural environment.<br>• The newly planted trees, shrubs and grassed areas are maintained throughout the first 12 months of the operation stage. | During operation phase | *Contractor* | | | √ | EIAO-TM |
| **Waste Management** | | | | | | | |
| S10.5.1 - S10.5.3 | *Good Site Practices*<br><br>Good site practices during the construction activities include:<br><br>• Nomination of approved personnel, such as a site manager, to be responsible for good site practices and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility.<br>• Training of site personnel in proper waste management and chemical waste handling procedures.<br>• Provision of sufficient waste disposal points and regular collection for disposal.<br>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.<br>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.<br>• A Waste Management Plan shall be prepared and submitted to the Engineer for approval. One may make reference to ETWB TCW No. 15/2003 for details.<br>• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed.<br>• In order to monitor the disposal of C&D material at public filling areas and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements to be implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may make reference to WBTC No. 21/2002 for details. | Work site / During the construction period | *Contractor* | | √ | | Waste Disposal Ordinance (Cap.54)<br><br>WBTC No.21/2002, ETWB TCW No. 15/2003 |
| S10.5.4 | *Waste Reduction Measures*<br><br>Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction | Work site / During planning & design stage, and construction | WSD/*Contractor* | √ | √ | | WBTC No.4/98, ETWB TCW No. 15/2003 |

| EIA Ref | Environmental Protection Measures | Location/Timing | Implementation Agent | Implementation Stages* | | | Relevant Legislation & Guidelines |
|---|---|---|---|---|---|---|---|
| | | | | D | C | O | |
| | include:<br>• Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.<br>• Separate labelled bins shall be provided to segregate aluminium cans from other general refuse generated by the work force, and to encourage collection of by individual collectors.<br>• Any unused chemicals or those with remaining functional capacity shall be recycled.<br>• Maximising the use of reusable steel formwork to reduce the amount of C&D material.<br>• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.<br>• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. | stage | | | | | |
| S10.5.9 | *General Refuse*<br>General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. | Work site / During the construction period | *Contractor* | | √ | | Public Health and Municipal Services Ordinance (Cap. 132) |
| S10.5.7 | *Construction & Demolition (C&D) Material*<br>When disposing C&D material at a public filling area, it shall be noted that the material shall only consist of soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt. The material shall be free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor. | Work site / During the construction period | *Contractor* | | √ | | WBTC No. 4/98, 21/2002, 25/99, 12/2000<br><br>ETWB TCW No. 15/2003 |
| S10.5.8 | *Chemical Wastes*<br>If chemical wastes are produced at the construction site, the *Contractor* would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes shall be used. Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes generated at the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. All chemical wastes shall be removed from the waterworks installations at the first instance. | Work site / During the construction period | *Contractor* | | √ | | |

Note: N/A Not applicable
*D – Design; C – Construction; O – Operation